A STUDY OF INDUSTRIAL FLUCTUATION

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An Enquiry into the Character and Causes of the so-called Cyclical Movements of Trade

BY

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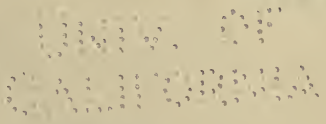
πάντα ῥεῖ.

Heraclitus.

Urge and urge and urge,
Always the procreant urge of the world.

Walt Whitman.



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In piam memoriam
J. R.

PREFACE.

§ 1. This inquiry into the character and causes of the so-called cyclical fluctuations of trade is based mainly on a study of the course of events in the leading industrial countries, especially the United Kingdom, from about 1870 till the eve of the great war. In August, 1914, it was submitted to the electors to Fellowships at Trinity College, Cambridge, and was successful. An earlier draft of the work obtained the Cobden Club Prize at Cambridge in 1913.[1]

In the ordinary course of events the essay would have undergone considerable overhauling before publication. A certain amount of technical apparatus and of detailed statistical material, more suitable in a dissertation intended primarily for the eyes of scholars and to give evidence of research than in a work designed to impress certain clear conclusions on a more general public, might perhaps have disappeared. But the pressure of other duties has prevented me from undertaking the task; and it became clear that unless publication was to be indefinitely delayed, the work must be published substantially as it stood.

§ 2. It may seem that at the present time there is little room for a book dealing in considerable detail with an economic world which has largely

[1] Certain sections of the essay appeared in a condensed form in the *Journal of the Royal Statistical Society*, March, 1914.

passed away, and with problems which may appear at the moment of somewhat remote interest. But I think to have refrained from publication on this ground would have been a mistake. In the first place, the problems here discussed, however much their form may have altered, are essentially those which are already causing anxiety to thoughtful minds and are likely to become of overwhelming urgency when finally "peace breaks out." No attempt indeed has been made to bring the text up to date or to consider the light thrown on the principles there enunciated by the new phenomena of a world at war. It is, and must now remain, a study of pre-war conditions. None the less, it is hoped that the facts and conclusions here presented may be found of some use by those leaders of thought and action whose function it will be when the time comes to guide trade and industry back into normal channels, and to minimise the disastrous results of our present colossal inroads on our accumulated wealth.

Secondly, paradoxical as it may seem, public opinion is perhaps likely to be in some ways more receptive now than ever before to a searching analysis of industrial problems, and less suspicious of drastic change. Necessity has destroyed many shibboleths and torn down many veils. One of the most formidable obstacles to currency reform —the alleged impossibility of persuading the well-to-do Briton to live without clinking golden sovereigns in his pockets—vanished in a week-end. The sacred machine of high finance has been shown to be at once infinitely vulnerable, and far more amenable than its hierophants supposed to conscious manipulation and control. When the safety of the nation and no longer merely the welfare of millions of its citizens is at stake, that accurate knowledge of the real state of our resources for which this

essay pleads has become a plain duty instead of an unthinkable impertinence. Even the deliberate manipulation of stocks in the public interest is now, in the case of sugar, wheat and cotton a familiar notion. Though the event demanded far other measures, there was in the early days of the war a readiness to apply on an unprecedented scale the device of bringing a Government demand for structural work to bear upon a slack labour market. Above all, the co-existence of brisk trade and employment with a war expenditure of £3,000,000 a day has compelled clear thinking on the real nature of saving and investment in the most unlikely quarters. In a hundred ways the shock of war is awakening men to a sense of the economic realities in a manner which, unless the nation and civilization perish in the interval, may form the prelude to a less thoughtless and anarchic industrial age.

That, indeed, is yet uncertain. It is not yet clear that the net result of the emergency extension of Government action will be to increase confidence in such methods in any country. Still less is it certain that human imagination will not fail once more to divert into the abiding struggle of man with his environment those streams of chivalry and resourceful effort unloosed, even in purely economic fields, by the stress of international war. It may be that the old *Natura nihil facit per saltum* will be justified by our relapse into the Heracleitan flux. But it is at least possible that in industrial as in other matters we are in the presence of one of those definite mutations of the social life which it is within the collective power of man to fix and foster in accordance with his highest hopes.

§ 3. I have had the great advantage of assistance and criticism from Professor Pigou and Mr. J. M. Keynes of King's College, Cambridge; to the latter in particular I owe more than it would be possible

to acknowledge. I am also indebted to Mr. W. T. Layton of Cambridge; and to various business men and others for the provision of documents and for information on specific points.

I have made such unremitting use of the *Economist*, especially the Annual Histories, that I have not thought it worth while to give the reference in every case.

To my friend Mr. H. D. Henderson of the Board of Trade I am indebted for great kindness in helping to see the volume through the press; and to Miss Pate of the Cambridge University Typewriting Offices for patience and skill in producing order out of the chaos of my MS.

Finally to my mother and sisters, and to my friend Mr. I. M. Hedley, I owe much thanks for constant companionship and encouragement in the pursuit of a somewhat laborious task.

November, 1915.

D. H. R.

CONTENTS.

LIST OF TABLES.

LIST OF CHARTS.

A Study of Industrial Fluctuation

PRELIMINARY CHAPTER.

§ 1. INTRODUCTORY.

THE causes of crises and depressions alleged before the various committees of Congress in the eighties amounted to some 180 in number, and included the issue of free railway passes and the withholding of the franchise from women. This list remained undefeated until M. Bergmann in 1895 was able to publish an exhaustive discussion in the German tongue of 230 separate opinions, arranged in eight categories. Indeed the problem of industrial fluctuation has exercised the minds of business men, economic writers and practical reformers of all schools throughout the past century: and within the last five years alone six weighty works, varying in length from 280 to 742 pages, have been published upon it in England, America and France. In these circumstances it might seem a presumptuous and superfluous undertaking to add to an already voluminous literature: nevertheless I conceive that no apology is needed.

For on the one hand, in spite of the obvious futility of many of the minor explanations that have been given, this does appear to be a case in which, in the deathless words of the Dodo, everybody has won and all must have prizes, in the sense that almost all the writers who have made any serious contribution to the study of the matter appear to have had a considerable measure of right on their side. But on the other hand each writer has been apt to over-

estimate the importance of his own work, and to neglect or under-value that of others; with the result that while the vital importance of the subject, affecting as it does the prosperity and even the livelihood of millions,[1] is generally recognised, there is as yet no single comprehensive explanation which may be said to hold the field. It is the author's conviction that the most important work which remains to be done lies in the direction of developing and synthesising the various and often conflicting opinions which have been already expressed: it is his hope that an approach to such a synthetic[2] exposition, with perhaps enough of original suggestion and illustration to justify its claim to rank as independent work, may be found in the following pages.

§ 2. DEFINITIONS.

It would obviously be desirable as a preliminary measure to arrive at a clear understanding of what is meant by the phrase "industrial fluctuation." By industrial fluctuation then I understand the alleged alternate occurrence of periods of industrial expansion and of industrial depression. But these phrases themselves call for further comment. The distinction between temporary financial *crises* and prolonged industrial *depressions* has been so frequently emphasised[3] that it is not necessary to dwell on it here. The more interesting question is, in what the depression may be said to consist: nor is the answer by any means easy to give.

[1] Little will be said in these pages about the disastrous social reactions of industrial fluctuation; for discussion thereof cf. Beveridge, *Unemployment*, chap. iii., and Tugan Baranowsky, *Les Crises Industrielles en Angleterre* (Fr. edit. 1913), Book III. chap. i., and *passim*.

[2] Such a synthesis is ascribed by Philippovitch to the modern German theoretical writers on this subject, in whose explanation "werden die Elementen der früher erwähnten Theorien benützt, sie werden aber aus ihrer Vereinzelung herausgehoben" (*Grundriss*, Vol. I. p. 425). But the result seems to be both confused and incomplete.

[3] Cf. for instance Burton, *Crises and Depressions*, pp. 6 ff. and the quotations there given.

First of all let us consider a single trade. I think it will be conceded on reflection that the term depression may in fact, without violence to the linguistic conscience of the ordinary reader, be applied to any of the following phenomena :—a decline in margins (i.e., in the difference between the exchange value of each unit of product and the exchange value of the component raw materials), a decline in profits, per unit of product, a decline in the aggregate net receipts of those engaged in the trade, a decline in aggregate profits or finally a decline in the ratio of profits to invested capital. Furthermore, while these various quantities and ratios are commonly reckoned in terms of money, we cannot deny the term depression to be at least equally applicable if they should be reckoned in terms of goods in general: indeed for the purposes of a definition which is to be used as the basis of anything approaching a scientific study, we must insist that they should be so reckoned.

Let us consider then which criterion of depression to adopt. There seems no good reason to regard a mere decline in margins—still less in one constituent element of margins—as constituting depression, unless it is accompanied by a decline either in aggregate net receipts, aggregate net profits, or the net rate of profits. Our choice then lies between these three. The fact that an inquiry of this character is obviously concerned with the welfare of all classes might suggest that the first alternative is alone admissible: but while this consideration establishes the advantage of the first over the second, it is not decisive against the advantage which the third derives from its insistence that the estimates which men make of their own prosperity do not depend solely upon their present enjoyment, but upon how far that enjoyment corresponds with their anticipations. It seems hopeless to attempt a decision. When we are discussing individual trades, the ambiguity will not always arise: when it does, attention will be drawn to it.

To pass on to the meaning of the phrase "general industrial depression." The alternatives of a decline in margins

or profits per unit are at once ruled out, since a general decline in money-prices clearly does not of itself constitute depression,[1] and a general simultaneous decline of exchange values in terms of goods is obviously meaningless: a fall in the exchange value of some goods implies a rise in the exchange value of others. The criterion of aggregate receipts must now be read aggregate volume of exchanges, or rather, I think (since some producers are also consumers and the inevitable Crusoe himself must be regarded as liable to alternations of prosperity and depression), "aggregate volume of consumption." If, however, we intend to adopt this criterion, we must recognise frankly that the volume of consumption is by no means an easy conception. It presents much the same difficulty as the conception of a general level of prices. If more of one thing X and less of another thing Y is being consumed at time B than at time A, how are we to tell whether, and if so, to what extent, depression prevails at B as compared with A? It would seem that what we want to compare is the aggregate amount of utility derived from the joint consumption of X and Y on the two occasions: but the utility schedules[2] of X and Y can only be known to us in terms either of money—and the sooner we get out of thinking in terms of money in this matter the better—or of assorted commodities: and the movements along the utility-schedules of these commodities are unknown to us just as are the movements along the utility-schedules of X and Y. The diffi-

[1] Some years ago indeed rising and falling prices might have been accepted as the final criterion of industrial expansion and depression: but the seeds of scepticism are now too widely sown. Falling prices may or may not be a symptom or a cause of depression, they are certainly not its essence. German writers however still use the French word "hausse" to denote the expansion (e.g., Spiethoff in Schmoller's *Jahrbuch*, 1902, i. pp. 721 ff.), though some of the French themselves, such as M. Lescure, prefer the more non-committal word "essor."

[2] By a "utility" schedule I mean a statement of the successive additions made to the "utility" or satisfaction derived from any commodity by the addition of successive increments of that commodity to the possessor's stock.

culty is not capable of general solution, but in certain cases a fairly confident answer can be given.

But there is a further difficulty. In making an estimate of the national dividend for ordinary purposes we are rightly warned [1] that when we have counted in the finished product, we must not also count in all the intermediate goods that went to its making. But it is only in a stationary state that the value of the intermediate goods consumed in any year bears any precise relation to the value of the finished products consumed in that year. In a discussion of inter-annual fluctuation, however, the hypothesis of a stationary state must obviously be discarded from the outset. Experience indicates (1) that the volume of instrumental goods consumed in any given year is relevant to the volume of finished products consumed not in that but over a number of succeeding years: (2) that the utility conveyed by the acquisition of these goods does not, in fact, bear any precise relation to the utility enjoyed from the consumption of the finished products produced by them even in subsequent years. We must then include, in our estimate of the consumption of the year, the utility of the capital goods created during the year: [2] nor need we be afraid for our purpose of including *also* the utility of the finished products created by them during the year.[3] Nor shall we follow Dr. Marshall in subtracting the utility of the commodities devoted to making good the depreciation of existing instruments.

While, however, we include the instrumental goods that

[1] Cf. Marshall, *Principles*, p. 79, and the discussion in the introduction to the final report of the Census of Production, 1912.

[2] In this following Marshall's conception of the national dividend: cf. Pigou, *Wealth and Welfare*, pp. 16 ff. A failure to apprehend the manner in which capital goods are thus commonly reckoned by the "orthodox" economic schools among things "consumed" seems to be at the bottom of M. Tugan Baranowsky's rather arrogant and unfortunate excursions into pure theory, op. cit., Book II. chap. i. §§ 2–4. Cf. *infra*, Book II. chap. ii.

[3] This Marshall's plan would *not* do—so far at any rate as the instruments render their services directly, e.g., a piano: it is not clear whether it would when they render them indirectly, e.g., a factory.

contribute to, it does not seem that we should include the materials which are actually transformed into, the finished product. There remain certain goods, of which the most obvious is coal, which seem to fall between the two categories. The best solution of the difficulty seems to be to include all those goods which do not actually enter into the physical composition of the finished product. This is obviously a purely arbitrary decision, the sole justification for which is that it seems to be least far removed from popular notions of industrial "expansion" and "depression."

Our estimate will also differ from ordinary estimates of the dividend in adding in the utility of consumable and of incompletely worked-up instrumental goods consumed but not produced (i.e., extracted from nature) and in subtracting that of those produced but not consumed in the year in question.

There remains still the alternative definition of depression as a period in which the consumption of investors is smaller than any anticipated. However paradoxical it may appear to stigmatise as depression a time in which the consumption of all classes is quite possibly increased, this definition has the same advantage in respect of industry in general as it has in respect of a particular trade. But there is an objection to it which, though perhaps somewhat obscure, is best faced at the outset. A disillusionment of investors in any single trade may arise either because the physical productivity of the instruments employed in that trade is less than was expected, or much more probably because the ratio of exchange has moved against that trade more than was expected. But a general disillusionment arising from the latter cause is impossible: nor is there any reason, especially in view of the nature of the most familiar symptoms of depression, to suppose that the former cause is more important with regard to industry in general than it is with regard to any single trade. If, therefore, general depression is to be defined as a condition of general disillusionment on the part of investors, this disillusionment must be quite

different in nature from that which is predicated of a single trade. While excessive investment in a single trade results in an undesirably *large* volume of its products entering into the consumption of other trades, excessive investment in *all* trades apparently results in an undesirably *small* volume of their joint products entering into their joint consumption.

The difficulty thus revealed is too far-reaching to be pursued further in this preliminary inquiry. The quest for a definition which shall be at once theoretically water-tight and in tolerable accord with popular usage must perforce be abandoned. But the labour spent upon it has not been wasted if it has only brought to light the inherent complexity of the problem. It is scarcely remarkable that no consistent and comprehensive explanation has yet been given of a phenomenon the precise nature of which it seems impossible to define.

§ 3. JUSTIFICATION AND METHOD OF DISCUSSION.

One further preliminary question remains. Granted that something which may fairly be called an alternation of industrial prosperity and depression really exists, is it anything to make so great a to-do about? Are these alternations likely to be a profitable subject of study? When we consider the anarchic nature of modern industry—how wants are satisfied and activities organised without the conscious guidance of any single directing power, the astonishing fact is surely not that fluctuations should occur but that all things on the whole should work together so smoothly and steadily for good. Since the possible sources of error and dislocation are so numerous, what is the use of investigating fluctuation as though there were anything strange or mysterious about it? This point of view, which lends itself readily to rhetorical argument, seems to spring from a healthy sceptical reaction against the almost superstitious atmosphere which has grown up round the subject: but it appears to me unsound for the following reasons.

In the first place, granted that there is nothing to be surprised at in the occurrence of fluctuation and that its causes may be infinitely numerous, it does not follow that it does not deserve study, both from a purely scientific and from a practical point of view. Exactly the same thing may be said of bodily disease.

Secondly, we have already had occasion to hint that variations are not caused solely by fortuitous external occurrences, but that each period of "expansion" contains as it were the seeds of its own dissolution: [1] so that we may perhaps be able to lay our finger on certain special features of modern industry which tend to give it a fluctuating character, and to which especial importance may be attached as compared with the miscellaneous crowd of potential sources of dislocation.

Thirdly, it is not so much the occurrence of fluctuations that has occasioned comment as certain peculiar features which are attributed to them. Thus it is urged that they tend to occur (1) simultaneously in all trades (so that niceties as to the precise meaning of the "volume of consumption" are superfluous), (2) simultaneously in all the leading industrial countries, (3) at approximately regular intervals. We shall see reasons for refusing to attach too much importance to this argument, and for holding that no less may be learnt of the causes of fluctuation from the divergence than from the similarity in this respect between different trades, countries, and periods. Nevertheless, the alleged phenomena seem to be sufficiently real to afford additional justification for a study of the subject.

A somewhat similar objection is urged by those who find the causes of fluctuations in what they call the "psychology of the business man" and assume without further argument that they are therefore incalculable and unfit

[1] Thus Lescure distinguishes between organic and inorganic theories of depression (*Crises générales et périodiques de surproduction*, p. 450), and Philippovitch somewhat similarly between crises which "auf aüssere Ereignissen (Kriege, Misseraten) zurückzuführen sind," and those which are preceded by a "Periode des Aufschwunges," involving its own opposite (*Grundriss*, I. 423).

for systematic study. Additional weight is lent to this view by the curious fact that it appears to be widely held among business men themselves; for a psychology, like a liver, is an apparatus of whose existence one is only aware when it is out of order. Nevertheless the economist can hardly be content with such a fatalistic view of the mental health of the business man as the latter is disposed to take himself. Granted that his peculiar states of mind are immediately responsible for industrial dislocation, it does not follow that they are spontaneously generated; it seems only natural, in the absence of proof, to give him the benefit of the doubt, and assume that they are in part at least induced, however irrationally, by external objective facts. Hence this objection also to the search for such facts falls to the ground.

A word remains to be said as to the method of discussion adopted in the following pages. The ideal method of economic exposition is perhaps to elaborate an independent constructive theory, treating the results and suggestions of others as material for incidental rejection or as buttresses to afford incidental support, and introducing facts rather as illustrations than as the formal ground-work of generalisations. While I have tried in the main to follow this method, it has not seemed to me at every stage entirely applicable. First, where the problem attacked is so familiar, the ground, as already indicated, is naturally thickly strewn with partial explanations, some of which are so complex or so famous as to demand consideration in the shape of rather more lengthy and formal digressions. Secondly, this problem more than any other in economics seems to me to have suffered from the neglect of a sufficiently wide and precise study of fact. Many theoretical writings on the subject assume without argument a simplicity of the actual phenomena under discussion which a closer study shows does not in fact obtain.[1] Others refer only to one set of

[1] Thus Mr. Hawtrey in a work almost innocent of appeal to fact (*Good and Bad Trade*, p. 215) asserts that "the phenomena of trade

facts, frequently of a monetary nature:[1] others again neglect large tracts even of that department of fact which they profess to discuss.[2] Though, therefore, a good deal of consecutive industrial narrative which formed part of a first draft of this work has been rearranged or entirely removed, a few such passages have been allowed to remain, in the hope that they may prove useful to some who, while rejecting the author's own explanations, may be glad to have more data than are at present available in a convenient form upon which to build explanations of their own.

As to actual procedure, a problem so complicated can only be approached piecemeal. I propose, therefore, in the first part to consider the causes of fluctuations in particular industries or groups of industries. The first group of chapters deals with those causes which must be sought primarily in phenomena of supply, the second with those which must be sought in fluctuations of demand. In the second part I propose to inquire how far these partial fluctuations are sufficient to explain the so-called general fluctuations of trade, and what further steps remain to be taken towards the construction of a comprehensive theory. The first two chapters form a sustained account of the essential features of the two limbs of the industrial cycle: the third discusses the peculiar features attributable to the existence of our wage and monetary systems: while the fourth contains a brief recapitulation of the whole argument, and some suggestions of practical policy. But

fluctuations are so well established that economists and statisticians on the one hand and business men on the other are all likely to agree as to whether "the correspondence" between his theory and the facts "is established": but I cannot think that his confidence is well-grounded.

[1] Notably Clement Juglar in his great work, *Des Crises Commerciales et de leur retour périodique*. It is curious that Tugan Baranowsky, while in his second (theoretical) part he reasons largely in terms of actual commodities, in his first (historical) part deals almost exclusively with monetary phenomena.

[2] I think Mr. Hull's work (*Industrial Depressions*, or *Iron, the Barometer of Trade*) is particularly open to this objection. Cf. Part I. chap. iii. § 2, *infra*.

in a discussion so complex some overlapping and a good deal of cross-reference will be unavoidable.

There remains one more point. In some of the more abstract portions of this essay I shall make use, without further explanation or apology, of the processes and terminology in common use among the school of economic thought associated in this country chiefly with the name of Dr. Marshall. My reason is that after a study of many facts and theories I am deliberately of opinion that one cause of the obscurity which still surrounds this problem is that in the attack upon it full and systematic use has never hitherto been made of the weapons supplied by this particular intellectual armoury. If I had thought it possible, consistently with brevity, clearness, and (as it seems to me) accuracy of thought, to express my arguments and conclusions in language more familiar to the ordinary reader and more universally acceptable to the trained economist, I would gladly have done so. But it has not seemed possible: and I conceive that the place of this school in the world of economic thought is sufficiently assured, and that its processes are, or ought to be, familiar enough even to those scientific thinkers who reject them, to justify their employment in an essay like the present.[1]

[1] I have, however, tried to concentrate into certain sections the more rigidly abstract portions of the argument. Such passages will be found mainly in Part II. chap. i. § 3, chap. ii. § 1 and § 5.

PART I.

Fluctuations in Particular Trades.

A. PHENOMENA OF SUPPLY.

CHAPTER I.

Temptations to Over-Investment.

§ 1. THE PERIOD OF GESTATION.

We are to begin with the causes determining the occurrence and intensity of fluctuation in individual industries, and first with those which are primarily concerned with conditions of production and supply.

It appears then that there are inherent in the modern system of large-scale capitalistic industry certain closely allied peculiarities which may produce in any trade, even in the absence of any fluctuation in demand, an alternation, the phases of which vary in length and intensity between different trades, between prosperity and depression. The first of these to be considered is what we may call the period of gestation, in other words the length of time necessary to construct and prepare for use the requisite instruments of production.

Let us suppose that for any reason the exchange value of the products of any trade has risen. There will then be an inducement to increased investment in that trade. But the new instruments ordered will not be immediately ready for use: meanwhile the high level of price [1] will

[1] This argument does not depend on the existence of a monetary economy: I use the word price in this book as synonymous with exchange value in terms of goods in general.

continue, and since each producer (in a competitive régime) is ignorant of the preparations which are being made by his rivals to meet the high level of prices, the total amount of new instruments prepared will be so great that the price of the product eventually falls below its old level. If the demand for the commodity is inelastic,[1] the total quantity of goods received by those who produce it will then be less than during the "boom" period: but even if it is elastic, it will be less than is sufficient to compensate for the increased efforts and sacrifices made in investment, since these latter have been greater than they would have been had the future course of prices been accurately foreseen.[2] The first drop in prices will occur as soon as the first batch of new instruments is brought into use: the longer therefore this period of gestation, the longer will the period of high prices continue, the greater will be the over-investment, and the more severe the subsequent depression.

This argument is, in fact, only a development of that doctrine of quasi-rent long familiar to students of Dr. Marshall's work: but the credit of its first formal application to the study of fluctuations seems to belong to Professor Aftalion of Lille.[3] There is ample evidence that

[1] Those to whom economic jargon is distasteful may be reminded once for all that the money-demand for a thing is said to be elastic when a given rise (or fall) of price produces a more than proportionate decrease (or increase) in the amount demanded: and inelastic when the proportionate change in amount demanded is less than the proportionate change in price.

[2] That is, while depression may exist in both of the senses indicated in § 2 of the last chapter, it only necessarily exists in the second.

[3] Cf. his articles in the *Revue d'Economie Politique*, 1909, and the more elaborate discussion in his recent *Les Crises Périodiques de surproduction*, Vol. II. Book VI. chaps. iii.–vii. With the aid of a good deal of statistical evidence he establishes the proposition that the course of production of the finished instruments of production does not coincide with that of the other generally accepted indices of prosperity (including the production of raw instrumental goods and the volume of *orders* for finished instruments), but lags behind it in an interval in general of about two years. The figures furnished by the Statistique de l'Industrie Minérale of the aggregate horse-power of the motive machinery in use in each year in various

the length of the period of gestation in different trades is an important factor in determining the intensity and duration of the various phases of their several fluctuations.

For instance, a glance at the first of the appended charts will suggest, and the more detailed study in Part II. chap. ii. § 4 will confirm the conclusion that while the coal and pig-iron trades pursue the same general course, the price of coal tends to reach both its maxima and minima later than that of pig-iron. While there are other causes for this, part of the explanation seems to lie in the longer period of gestation necessary in the coal trade. According to Mr. Hull[1] it takes "practically a year" in America to build a new blast furnace. From an English ironmaster I gather the impression that in this country some fifteen months would be required. But a coal mine which is begun to be sunk now

industries in France are of particular interest. It appears to me, however, that owing to his determination to allow little or no importance to the influence of demand, M. Aftalion is under a constant temptation to exaggerate the length of the period of gestation. Hence his grouping of years into periods of large and small production seems often to be somewhat arbitrary, and to yield a longer lag than the figures themselves warrant. To give only one instance, there seems no justification for concluding from the following figures that the lag with locomotive engines is as long as *three* years.

		Value of locomotives contracted for.		Increase in number of locomotives in use.	
"High" period	1897	12·8	in francs	32	"Low" period
	1898	28·9	,,	37	
	1899	19·6	,,	81	
	1900	45·2	,,	268	
"Low" period	1901	11·3	,,	369	"High" period
	1902	10·8	,,	158	
	1903	9·2	,,	156	

(*Op. cit.*, Vol. II. pp. 59 and 99).

Here, while the concluding years of M. Aftalion's "high" periods are separated by an interval of three years, the actual maxima are separated only by one.

My own investigations were chiefly made before the appearance of M. Aftalion's detailed evidence, but in persuance of the suggestion made in his earlier essay, and of a similar suggestion—comprising also the principle of chap. ii. § 2—made to me in conversation by Mr. G. Udny Yule.

[1] *Industrial Depression*, p. 207.

will not be in working order for several years. Further, it seems likely that the period of gestation in the coal trade should have become longer during the past half century with the necessity of sinking deeper shafts. It is likely perhaps, moreover, to be longer for those mines sunk towards the end than for those sunk towards the beginning of the boom.

This *à priori* reasoning is confirmed by the figures. In the boom of the '70's the first considerable rise in prices took place in 1872, and began to make its full effect on output felt in 1875. Between the break of prices in 1873 and the new influx of 1875 there was restriction of output.[1] Again, since new enterprises were apparently begun at least as late as 1874,[2] production was not restrained till 1878; though, indeed, before the latter year some of the worst mines had begun to go out of use.[3]

In the next cycle the first considerable rise in prices was in 1882; consequently (assuming the period to have increased to about five years) the new influx was delayed till 1887. High prices continued till 1884, and large production till 1889; but by 1890 (five years after the slump) we might expect to find some restriction, had not a new demand for coal arisen in that year, so that the end of this cycle is, as it were, telescoped into the beginning of the next.

In the next cycle high prices began in 1889 and ended in 1891, so that (still with a five years' period) the new influx began in 1894 and increased till 1896. Again, a new

[1] The initial break in prices must, I think (in opposition to M. Aftalion), be referred to a relapse in demand.

[2] In December, 1873, we learn that "the proposed line from Mansfield to Worksop will aid materially in opening out a vast tract of highly mineralised ground, so that collieries will be opened out in a straight course of from 30 to 40 miles."—*Economist* History of 1874. And "during 1875 no less than 111 new collieries were in the course of sinking in the West Riding of Yorkshire alone."—*Id.* of 1876.

[3] Number of collieries working: 1873, 3,627; 1875, 4,501; 1877, 4,231. *Times*, January 1, 1878.

demand for coal arose in 1897, so that this cycle and the next are telescoped together.[1]

In the next cycle the analogous quinquennia are 1897–1902 and 1901–06, leaving room for restriction of output in 1901. Again, as on every occasion except 1878–79, the final curtailment is rendered superfluous by rising demand. In the next cycle it seems more reasonable to refer the new growth of output in 1909 to failure to check permanently the vast additions to the source of supply made in the 1900 boom than to the boom of 1906–07, which supposes an improbably short period of gestation. Indeed, I have heard of enterprises undertaken in the 1900 boom which, even in 1912, were not in working order; and, of course, in every case the new mines of one cycle form a permanent addition to productive capacity, ready to take advantage of the first stirrings of demand in the next—witness the large expansion of output under an apparently inadequate price-stimulus in 1880–81.

Mr. D. A. Thomas indeed, writing in 1903,[2] asserted that very few new enterprises had been started during the 1900 boom, which is puzzling in view of the subsequent course of prices and production.[3] But it seems not impossible that the period of gestation is now becoming so long as to prove a tolerably effective deterrent from over-investment in times of boom.[4] This proposition is, however,

[1] The stagnation of production in 1898 was due primarily to the South Wales strike: but it is perhaps worth also pointing out that the investment in new mines five years before (i.e., in the year of the great midland strike, 1893) is likely to have been abnormally small, even for a year of depression.

[2] *Stat. Jour.*, 1903.

[3] The reports of companies in 1904 indicate a much severer depression in coal than in iron.

	3 Coal Companies.	16 Iron and Steel Companies.
1902–3 (year ending June 30) ..	£190,881	£1,681,000
1903–4	92,528	1,537,611

Economist, 1904, p. 1,540.

[4] "At the present time," I have been told by the representative of a large mixed iron-works, "there is nowhere we could sink a new colliery, except a few parts of Yorkshire and the South of England; and even so we should not see any coal for years." If this view is

also disputed by Mr. Thomas, who claims that it has become shorter with improvement in the methods and appliances of pit-sinking, and is in South Wales to-day not above three years.[1] While unwilling to dispute so high an authority, I connot help thinking that his conclusions, both as to the extent of investment in the 1900 boom and as to the present period of gestation, while no doubt entirely correct for his own district, may be subject to modification for other parts of the country.

In the shipping trade the influence of the period of gestation is very much complicated by fluctuations in demand; but its effect upon investment policy can be clearly traced. The actual time occupied in building a tramp steamer of the usual size, i.e., about 7,000 tons,[2] under favourable conditions—i.e., if there is no exceptional scarcity of labour or materials—is under a year. Hence we might expect to find the new tonnage beginning, within a year after the beginning of a boom, to show its effect in reducing the orders for new construction. We may explain on these lines the check to new contracts in the fourth quarter of 1910 (see Chart V.). As a rule, however, the flood-tide of demand seems to carry the volume of contracts over this first dead point. And as the tide flows the period of gestation lengthens, for (1) the capacity of the yards is limited, so that some months may elapse after the placing of an order before the vessel is begun; (2) there is a growing

correct, it follows that while up to a point a lengthening of the period of production aggregates the intensity of fluctuation, a further lengthening may actually mitigate it. The gradual working out of the British coalfields is an excellent illustration of the truth that a "secular" or "trans-cyclical" change may be important not only in itself but in its influence on the course of "cyclical" fluctuation.

[1] In a valuable criticism of a paper by the present writer, *Stat. Jour.*, Jan. 1914, p. 173, Mr. Thomas ascribes the stagnation of production in South Wales since 1907 entirely to labour troubles.

[2] The *average* tonnage of the ships built in 1912 was 2,676, and this figure was exceptionally high; but the *most frequent* size was much greater. Thus of the 108 ships under construction, December 31, 1912, 69 were between 6,000 and 10,000 tons (*Lloyd's Register Annual Summary*).

pressure on the supplies of labour and materials, so that delays occur also *after* construction has begun.[1] Thus the period is prolonged to as much as eighteen months. For instance, the flood of new ships launched early in 1906 seems to have been composed largely of those ordered late in 1904,[2] and at the end of 1912 builders were stated to be full of work well into 1914.[3]

The first severe falling-off in new contracts is thus often found some fifteen to eighteen months after—not the first increase—but an exceptionally large increase in the volume of such contracts. Compare the third quarter of 1889 with the first of 1888, the first of 1899 with the last of 1897, the third of 1906 with the first of 1905, the second of 1913 with the first of 1912. Yet even so, the flood of demand is not exhausted. Some eighteen months after the maximum of tonnage under construction is passed, i.e., just when the efflux of new ships from the yards is likely to have spent its full force, there are often signs of a renewal of orders, and a second or even a third maximum is attained, sometimes, though not always (1901), subordinate. Compare the last quarters of 1890 and 1891 with the third and second quarters of 1889 and 1890 respectively, and the second and fourth quarters of 1900 with the first and third of 1899.

Attention may be briefly drawn to evidences of the influence of the period of gestation in a number of other trades. In English railway building the following figures[4] suggest a period of about two years.

A comparison (see chart) of the average profits of 100 cotton-spinning firms[5] and of the net increase in the number

[1] The delay may be enhanced by labour disputes, e.g., the boiler-makers' lock-out (1910) and the coal strike (1912).

[2] Cf. *Economist*, 1906, p. 1,207.

[3] Messrs. Moss' *Circular*, January 1, 1913. In view of the large part played by tank-steamers in the recent record shipbuilding boom, it is significant that "it takes much longer to build an oil-tank steamer than an ordinary steamer" (*Statist*, August 10, 1912).

[4] Taken from *Whitaker's Almanack*.

[5] Estimate of Mr. John Kidger of Oldham, quoted in *Economist* Histories.

of spindles at work[1] suggests that at the beginning of a boom the period of gestation is about a year. Thus in 1889, in spite of the excellent Indian and Continental inquiry,

	Mileage Authorised.	Mileage Opened.		Mileage Authorised.	Mileage Opened.
1843 .	Inconsiderable	—	1847 .	1,663	909
1844 .	797	—	1848 .	300	1,182
1845 .	2,883	—	1849 .	—	904
1846 .	4,790	595	1850 .	—	590

the new crop of spindles projected in the boom year 1888 was able to produce a perceptible check in the advance of profits. Similarly the effects of the over-investment of 1890 are clearly seen in 1891.[2] When the wave of rising demand is prolonged, however, we should expect the period to become somewhat longer. This is confirmed by the following figures from a series of annual articles in the *Economist* for January :—

[*In thousands*]

	Spindles in Mills under construction, January 1.	New Spindles started in Year.		Spindles in Mills under construction, January 1.	New Spindles started in Year.
1899 .	700	340	1905 .	2,985	1,460 *
1900 .	880	708	1906 .	4,350	3,029
1901 .	1,025	865	1907 .	4,301	2,249
1902 .	1,140	951	1908 .	4,363	1,660
1903 .	720	?	1909 .	3,043	?
1904 .	?	?			

* Last six months.

[1] Messrs. Ellison's estimate, 3rd Fiscal Blue-book, Cd. 4954, 1909, p. 157.

[2] In the woollen industry also the period seems normally not to exceed a year. Thus in 1872 the trade was already suffering from

Assuming a uniform rate of contracting and construction the typical period of gestation for any year is given by dividing column 1 by column 2.[1] The result is 1·24 years for 1900, 1·13 for 1901, 1·44 for 1906, 1·91 for 1907 and 2·63 for 1908. This result suggests among other things that the period of gestation is longer, and the subsequent slump therefore more acute, when the cotton boom synchronises closely with than when it lags behind the constructional boom.[2]

The period of gestation in the cotton trade is also reflected in the course of our trade in cotton yarn to the Continent.[3] The check in 1882 seems to have been due to the rapid development, in response to the high demand of 1881, of the home capacity of France.[4] Similarly in Germany a maximum of yarn imports from England was reached in 1889; of home consumption of raw cotton not till 1891.[5] Again a maximum of imports was reached in 1898, while the

the excess capacity prompted by the flood of continental orders on the restoration of peace in 1871. The dropping profits of 1890 are probably to be referred chiefly to over-investment during the high tide of 1889, and those of 1907 and 1911 partly to over-investment in the revivals of 1906 and 1910 (but cf. also pp. 72 and 109).

[1] For instance, of the 700,000 spindles under construction on January 1, 1899, only 340,000 came into being during the year: the time required to complete 700,000 is, therefore, $\frac{700}{340}$ year.

[2] Investment policy in the recent boom seems to have been considerably more moderate than on previous occasions.

[3] The survival of the importance of our yarn exports over that of our manufactured exports to the Continent is probably due to the fact that the English advantages of climate and transmitted skill are of more value in spinning than in weaving. Cf. Chapman, *Cotton Industry and Trade*, p. 72.

[4] The number of spindles increased from 4,609,020 in 1881 to 4,927,624 in 1882. (Neumann-Spallart, Uebersichten, apud Lescure, *op. cit.*, p. 153. Messrs. Ellison, however, only record an increase from 3,840,000 to 3,900,000.) The revival in 1883–84 was due mainly to Germany.

[5]

	No. of Spindles.	Consumption.
1888	5·10 million	3·6 m. cwts.
1889	5·25 ,,	4·5 ,,
1890	5·50 ,,	4·6 ,,
1891	5·75 ,,	4·8 ,,
1892	6·03 ,,	4·5 ,,

Cd. 4954 of 1909, pp. 157, 159.

prosperity of the home trade lasted through the following year.[1]

To turn to a very different industry. "The coffee plant," says a writer in the *Economist*,[2] "does not produce marketable berries for five years"—in other words, five years is here the normal period of gestation. It is therefore significant that the first check to the coffee glut which marked the turn of the century occurred in 1903, five years after the first loud complaints of over-production.[3]

The big crop of 1906 induced the Brazilian Government to undertake its "valorisation" scheme, and was followed by the immense production of 1907. It may be pointed out that the reduced crop of 1903 was originally estimated at the still smaller figure of 8,000,000 to 9,000,000 bags; that this may well have led to extended plantings, and that the favourable weather which produced the record crop of 1907 may well have brought some plants to maturity before the normal time. Nor, I think, is it accidental that the maximum crop of 1910 occurred five years after the minimum crop of 1905, the minimum of 1911 five years after the large crop of 1906, which brought the anxiety of growers to a head; the new maximum of 1912, five years after their hopes had again been raised by the high-sounding pretensions of the Government; and the relapse of 1913, five years after the futility of the scheme had become obvious. We may, perhaps, expect some further reduction in the 1914[4] crop, to be followed by an increase in 1915, five years after the high-priced year 1910.

[1] According to Lescure, who bases his statements on Sybel, Baumwollindustrie, Cd. 4954 shows a fall in consumption from 6·8 to 6·2 m. cwts., but these figures confessedly take no account of spinners' stocks.

[2] 1911, Vol. I. p. 257.

[3] 1896–97 were years of prosperity to the producing interests; and though in the latter year there was an ominous increase of production, yet "when supplies were at their heaviest prices were relatively high, as both dealers here and on the Continent had run their stocks so low that they were compelled to buy."

[4] Though the preliminary estimate given in Table V. does not support this view.

In other cases the period of gestation is very much less uniform. For instance, the copper market seems to have been weakened in 1908–10 by the output not only of the mines, such as those of Servia, opened up in the recent boom, but of such sources as the great Cerro de Pasco of Peru, founded as far back as 1898 but only just beginning to make its full effect felt; as well as of hundreds of small mines founded in the boom of the nineties and closed down after the 1901 *débâcle*, whose period of regestation was very brief, and who clung tenaciously to their new lease of life. In other cases the period of gestation can be altered at will within fairly elastic limits. Thus in Ceylon a rubber-planter tells me that while the trees do not begin to reach full maturity for five years,[1] it is not uncommon to tap them after two years if the conditions of demand are specially favourable.

It only remains to point out that the period of gestation comprises the time necessary not merely to bring the new products physically to the birth but also to bring them to the place where they are required. If, therefore, the rise in exchange value proceeds from an increase in demand to which the instruments of transport are unable immediately to respond, the period may be considerably lengthened.

For instance, the copper boom in America and the steel boom in Germany in 1907 were prolonged, and the consequent over-investment aggravated, by the shortage of fuel and railroad cars. Thus also while a new oil-field is usually bearing within a year of the inception of its development,[2]

[1] The colossal investment of 1909 is only now beginning to make its full effect felt on prices.

[2] Cf. Table I. Thus the boom of 1906 led to a great wave of investment, especially in California, Roumania and Dutch Indies; and in the same year the German Government awoke to the possibilities of oil fuel as a substitute for coal for naval purposes, and set itself to develop the resources of Galicia. (Cf. *Daily Chronicle*, June 19, 1913.) The result is seen in the production figures of those countries for 1907. Again the expected rise in oil prices in February, 1910 (for which see p. 169), led to a rapid increase in the output of the Californian fields, the opening up of the great

the price of petroleum remained at a famine level throughout 1912 owing largely to the shortage of oil-carrying tonnage.[1]

Finally it may conveniently be noted here that when the transfer of a product through space involves appreciable delay, not only a universal but a *localised* rise in its exchange value may result in over-investment: in other words what we may call the period of transference plays in such cases the same leading rôle which has been ascribed in other cases to the period of physical gestation. The point is of importance because it disproves the contention sometimes heard that the natural tendency [2] to interlocal compensation in the sources of demand might be expected to prevent altogether the occurrence of industrial fluctuation.

The best illustration of this proposition is afforded by the production of the service of sea-transport. In spite of the well-known willingness of tramps to undertake long voyages in ballast in the hope of return cargoes, distance appears still to oppose considerable obstacles to the movement of tonnage from one trade to another. For instance, in spite of the failure of the Russian demand in the end of 1891, freights remained high in the North Atlantic trade, and were a sore temptation to incautious owners to increase their tonnage. Similarly the concentration of steamers in the Far East after the Chino-Japanese War in 1896,[3] and in Australia owing to the miners' strike in 1909,[4] raised freights in other trades and increased the volume of new

Maikop field in Russia, a new flood of investment in Roumania and in the West Indies, and an attack by the new Commonwealth Oil Corporation and Australian Oil Company upon the Australian supplies (cf. *Ec.*, 1910, ii. 970, 1,327), all of which made their effect felt in the production figures of the same year.

[1] For further discussion, see p. 168.

[2] Cf. p. 148.

[3] Aggravated by the Indian famine, which curtailed the supply of homeward cargoes.

[4] *Ec.*, 1910, i. 430. Cf. the maintenance of Australian freights in 1913, owing to the reluctance of steamers to sail from the Argentine in ballast for fear of being prevented from recoaling by labour troubles at Delagoa Bay (*Times Suppt.*, Jan. 16, 1914, p. 6).

contracts, though the total supply of tonnage was fully adequate to the demand. This consideration helps also to explain the special intensity of fluctuation in the building trade. A migration of population does not, of course, increase the aggregate demand for house-room, but it does increase the demand for new building, for the period of transference is in this case infinitely great. Thus the great building boom in London in the '90's was accompanied by a *net* increase in the number of inhabited houses of only 17,000 (as compared with 58,000 in the previous decade), though in Wandsworth and Lewisham alone there was an increase of 19,837.[1] Moreover, not only the instruments of production but those who produce them seem to be afflicted with immobility: with the decentralisation of London "each new suburb tends to get a building trade of its own as it rises to importance; and its chief firms compete with those of older standing elsewhere."[2]

§ 2. ACCESSIBILITY TO INVESTMENT.

The temptations to over-investment fostered by the length of the period of gestation are fostered also by another characteristic of modern industry—its accessibility to investable resources. The differences between trades in this respect are an important cause of the differences in the intensity of their fluctuations.

While most of the causes of fluctuation which we have to consider are more strongly operative the larger the fixed capital required, that before us now is more serious, other things being equal, the smaller that fixed capital. Thus in cotton-spinning not only is the amount of floating capital required comparatively small,[3] but the multiplication of

[1] Dearle, *Unemployment in the London Building Trade*, pp. 30–1.
[2] *Ibid.*, p. 40.
[3] *Ec.*, 1907, p. 2,023.

productive capacity comparatively cheap,[1] and the temptation to over-investment *pro tanto* more severe.

Again, accessibility is greater where joint-stock management prevails than where private enterprise is the rule. Thus in cotton-spinning, which is mostly carried on by joint-stock companies, fluctuation seems to be more severe than in cotton-*weaving*,[2] which, owing to differences in the requirements of management,[3] is mostly in the hands of private firms. Thus weavers were less severely affected than spinners in the depression of 1902; and in the present boom they seem to have profited more owing to the comparative shortage of looms.[4]

This consideration, however, is sometimes, notably in the shipping industry, overborne by another—easy access to the short loan market. In the depression of 1908 in particular loud complaints were heard of the system of "long credits," by which speculative owners with inadequate capital and experience had been enabled to make large additions to their fleet by means of advances from the money market.[5] Again a considerable share of the cheap money of the '90's, when the doors of foreign investment were closed, seems to have drifted for want of something better to do into the hands of such owners. In the recent boom it appears that these facilities have been considerably curtailed, and that both bankers and private individuals have been displaying more caution.[6] It is noteworthy

[1] Lescure, *op. cit.*, p. 229.

[2] Not that the weaving trade has been innocent of over-investment, particularly in 1906–7; cf. Messrs. Ellison's circulars.

[3] Cf. Chapman, *Cotton Industry and Trade*, p. 44.

[4] Cf. Ellison, reports of seasons 1910–11 and 1911–12.

[5] Cf. *Economist*, 1908, i. p. 9.

[6] Cf. *Times*, Shipping Supplement of Dec. 13, 1912, p. 14. Something of the same development seemed to be in the mind of a Liverpool business man of long experience, who told me that he remembered three periods of business methods: one when a new enterprise in any industry was financed through some large house in that industry; one when the banks had begun to enter into competition with these old-established houses, and invest the deposits

that of the tonnage under construction at the end of 1912 the majority seems to have consisted of liners and tank steamers;[1] and the confidence with which a revival in the level of freights was long anticipated[2] seems to be partly due to the disappearance of the impecunious tramp-owner relying on cheap money.

Where the long credits are furnished not by the money-market to the manufacturer but by the manufacturer to the wholesaler, the effect upon investment is the same. Thus in 1886[3] and again in 1899[3] the boom in the woollen industry was accentuated by the speculative purchases of wholesalers fostered by the system of six to twelve months' credits in vogue in the trade.

Similar differences prevail not only between different industries but between the same industry in different countries. In this connection the different course in England, Germany and the United States of the boom in electrical transport and lighting which had its origin in the 90's is worthy of attention.[4] In Germany, where the new undertakings met with generous financial assistance from the Banks, the boom proceeded without interruption from 1894 to 1900. But the over-investment and the consequent

of the public often without any real knowledge of the prospects of the investment; and finally within the last few years a tendency, with rising prices and a rising rate of interest, for investors to take more trouble for themselves to find out remunerative openings, this tendency reacting upon the banks and making them also more critical of applications for loans.

[1] Moss, *Circular*, Jan. 1, 1913. Cf. *Statist*, Aug. 10, 1912. "Of all the new contracts reported as booked by the Scotch builders in July there was not a single cargo steamer or tramp."

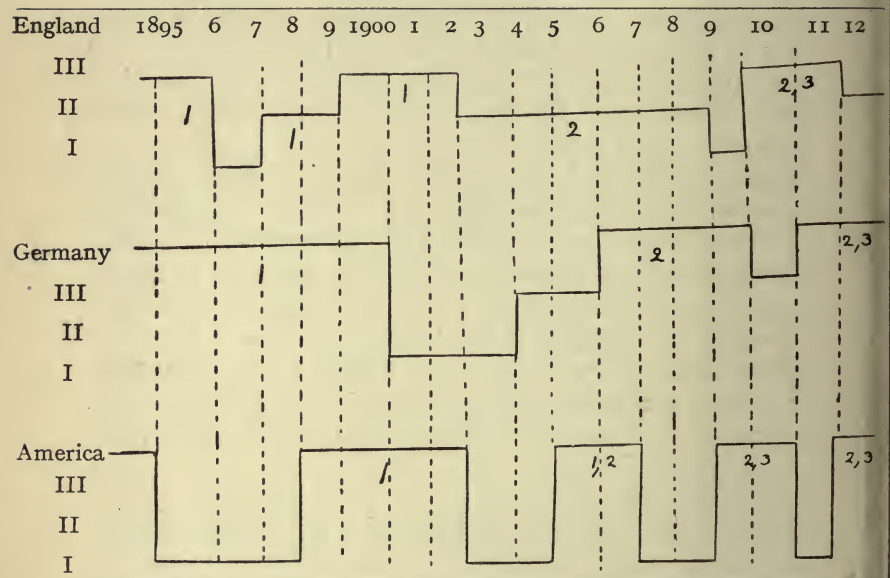
[2] Cf. *Times* of July 8, 1913, p. 22, where the dip in freights was attributed entirely to seasonal causes. The competition of the big lines has however proved more formidable to the tramps than was expected (cf. *Times Review*, Jan. 16, 1914, p. 6).

[3] Cf. *Ec.* Histories of these years. On the latter occasion especially there were loud complaints of the system, and some attempted breach of contract by wholesalers when the inevitable reaction came in 1900.

[4] The following diagram of electrical history in the three leading countries may be appended here for reference :—

reaction were correspondingly severe, and in 1901[1]–3 the transport and electrical industries underwent a serious depression. In England on the other hand progress was considerably slower; and in 1897 the capital invested in the electrical plant manufacturing industry only amounted to some four or five million pounds, as compared with ten to twelve million in Germany.[2]

But if progress was less rapid[3] in England, it was longer



Level III = great advance, II = moderate advance, I = relapse. The arabic numbers indicate the predominant feature of the boom, 1 standing for illumination and tramways, etc., 2 for manufacturing, and 3 for railroad electrification.

[1] Copper consumption declined in 1901 by 20,000 tons.

[2] Messrs. Lewis, *Circular* of 1898. Indeed the statistics of English copper consumption showed an actual decrease in 1897 of 5,750 tons (as compared with an increase of 13,500 tons in Germany, and of nearly as much in 1898. But this seems to be merely one of the many traps lying in the road of those who would try to draw conclusions from the published statistics of copper, and to indicate merely a contraction of stocks in the hands of consumers. Nevertheless this is sufficient to indicate the presence of a more cautious spirit in English manufacturers than prevailed in Germany.

[3] The delay seems to have been due in part to the policy of English municipalities, many of which owned extensive gas plants, and

sustained. In 1899 two of the largest foreign electrical machinery manufacturing companies established their works in the Midlands: in 1900, fired by the success of the tubes, the old Metropolitan railways were electrified, by 1902 the process had been extended to many suburban lines and to the London Municipal Tramways, and by 1903 to the tramways of Middlesex and North London.[1] Thanks to its more moderate and controlled expansion, the English electrical industry escaped altogether the catastrophe that befell its German neighbour. In America as in England the boom of 1895 was a half-hearted one,[2] and it was not till 1899 that an expansion really set in.[3] One is forced to the conclusion that in Germany easy access to the money market enabled the mere fact of invention to accomplish that which in other countries required the co-operation of other factors.

Finally some instances may be given of the effect of sudden increases of accessibility in stimulating investment. The Limited Liability Act of 1859 and the joint-stock Acts of 1862 led to a sudden increase of accessibility in

put hindrances in the way of electrical development: just as the check to the German industry, in 1910, when copper consumption remained stationary, must be referred to the delay in the electrification of railways, due partly to the obstructionist policy of the Prussian Government (*Ec.*, 1910, ii. 925).

[1] English consumption of copper rose by 21,000 tons in 1900, broke all records in 1901, and was responsible for the greater part of the European increase of 53,000 tons in 1902: while the published decrease of 17,740 tons in 1903 is again held by Messrs. Lewis to be misleading, since "much more copper has been used for electrical purposes."

[2] While the consumption of copper in Europe increased by 42 per cent. in 1896, that in the United States declined by some 11,000 tons, or about 11 per cent. In 1897 there was a slight increase of some 4,000 tons, and in 1898 a renewed fall of 8,000 tons; and the slight rise in price was only rendered possible by large exports to Europe.

[3] In spite of the exactions of the Copper Trust, American consumption increased in that year by 55,500 tons, or 44 per cent., and the electrification of street railroads proceeded apace. In 1900 consumption increased again by 23½ thousand tons, in 1901 it is described as "phenomenal," and in 1902 it rose by another 55½ thousand tons.

numerous trades and countries, and precipitated the crisis and depression of 1866.[1] In Germany the transport boom of the '90's was accentuated by the law of 1892 facilitating the construction of local railways, the length of which increased from 1,034·8 km. in 1892 to 8,454·9 km. in 1901.[2] The analogous French law of 1880 seems to have had a similar influence.[3]

[1] Cf. Lord Goschen's famous "Seven per cent." The effect upon railway building is discussed in chap. ii. § 3.

[2] Lescure, *op. cit.*, p. 208.

[3] *Ibid.*, p. 149.

CHAPTER II.

Aggravations of Depression.

§ 1. IMPERFECT DIVISIBILITY AND INTRACTABILITY OF THE INSTRUMENT.

The next characteristic of modern industry which calls for our attention is the large size of the most convenient scale of production and consequently of the most usual unit of investment. The individual producer is not merely ignorant of the extent to which his rivals are enlarging their productive capacity: that knowledge would not in any event be sufficient to control his actions. He is in any case either compelled, or at any rate subject to strong temptation, to enlarge his own capacity to an extent which is not warranted by the rise in the exchange value of his product; and the severity of depression is correspondingly aggravated.

This difficulty of the imperfect divisibility of the unit of investment is most acute in those industries which are often loosely but conveniently lumped together as "public utility services"—those, that is, which require the construction of a large continuous distributive plant. This is one important cause of the prominent part played by railway enterprise of various kinds in the history of industrial fluctuation. The provision of illumination belongs to the same category.[1]

[1] For instance, we find that in November, 1906, the Berlin Electrical Works, founded many years before, had just reached the limit of their generating capacity, and are projecting a new plant of 18,000 h.p. (*Ec.*, 1906, 1875). Similarly in England in 1911 "the poor return on the capital" of electric supply companies "in some

Closely allied with this peculiarity is another which can best be described as the intractability of the unit of investment. Producers in face of depression are not only unable, owing to the discontinuity which would characterise the process of putting their plant out of operation, to attain that level of production which they would have chosen had they been perfectly free agents: it will often no longer be to their interest to do so. Provided that the demand for their products is elastic,[1] the best they can do will be to maintain production on the largest possible scale. If, however, production is so largely increased that the demand is inelastic, their right course will depend upon the degree of its inelasticity and upon the ratio of the special costs incurred in maintaining in operation a given unit of plant to the cost involved by closing it down and by making provision for putting it back into use. Other things being equal, the greater this ratio the less severe will be the depression from which they suffer.

The contrast between different industries in this respect is well illustrated by the British pig-iron and coal trades. For technical reasons, a mine-owner is very unwilling to shut down a colliery or any part of a colliery that has once been opened;[2] but the damping down of a blast-furnace, though inconvenient and expensive, is a comparatively easy matter. Indeed in this country even in the most prosperous times a large percentage of the blast-furnaces

cases is due to the inability of the companies to employ their plant to anything like its full capacity" (*Id.*, 1911, i. 612). These cases of transport and illumination show clearly the difference between the points elaborated in this and the preceding chapter. For though a large unit of investment usually implies a long period of gestation, the excesses of *competitive* investment which make the length of the period an important determinant of the severity of depression are prevented in these trades by the prevalence of a limited monopoly.

[1] I.e., that depression only exists in the second of the two senses discussed on p. 3.

[2] "When long wall is the system of working there is a serious risk that the roof may fall in and the working faces be closed up if any portion of the pit is left unworked for more than a few days" (*Ec.* H. of 1896, p. 20).

in existence are out of use.[1] Thus the divergence between the productive power in existence and the productive power in use is much greater with pig-iron than with coal: even, therefore, if over-investment has been less in the latter than the former trade, the resultant depression is less easily mitigated.[2]

A similar difference may sometimes be observed between the same industry in different countries. A glance at Charts I. and II. will show that while in England the production of pig-iron is normally restrained before the price breaks, in America (in spite of the greater effectiveness of combination) production has constantly tended to increase after the break in prices, and so to aggravate their fall. One cause of this must, I think, be found in the superior size and capacity of the American furnaces,[3] which renders their damping down a more serious matter.[4]

It should be observed that with most minerals the difficulties in the way of restriction do not seem to be so universal as with coal. Thus while in the slump of 1908–09 the Amalgamated Copper Company was averse from restriction,

[1] Furnaces.

	In existence.	In blast (average for year).
1880	959 ..	590
1889	813 ..	477·10
1899	596 ..	409
1900	562 ..	397
1906	517 ..	367·75
1907	507 ..	366·25

A large number of the disused furnaces are no doubt antiquated and unsuitable, but still the British ironmaster seems deliberately to prefer to keep a large margin of power in reserve. [Figures from Brit. Iron Trade Ass. Reports.]

[2] According to figures given by Sir Robert Giffen (quoted *Ibid.*, 1878) between 1867 and 1875 the capital invested in ironworks increased 314 per cent., in mines only 195 per cent. But it will be seen that in the depression of the '70's, the price of coal fell 63 per cent., the price of pig-iron 58 per cent., below the maximum of 1872.

[3] The average annual capacity in Great Britain in 1905 was 28,000 tons, in America twice (and in Pennsylvania nearly three times) that amount. Jeans, *English Iron Industry*, p. 41.

[4] In America in 1912 "many additional furnaces would have been banked if they had been in a condition to stand the strain" (*Ec. H.* of 1912).

as its operations were most economically conducted on a very large scale, the great Anaconda mine kept in reserve three shafts with a capacity of over 26 million lbs. a month, the re-opening of which was only a matter of weeks.[1] Indeed the extractive industries as a whole would naturally seem to be more favourably situated as regards restriction of output than either agriculture or manufacture, since the special costs involved in maintaining the maximum output include a considerable allowance for depreciation of the capital value of the property.[2]

In the shipping trade the influences adverse to restriction are strengthened by special causes. In times of low freights much tonnage continues to be actively employed which is not really earning enough to cover special costs. The reason is that owners accept outward cargoes at obviously unremunerative rates in the hope of obtaining homeward freights which will cover the cost of the double voyage; and this hope is often not fulfilled.[3] More especially is this liable to occur in the numerous instances in which ships are managed on a commission basis on behalf of the owning company. The manager, in order to obtain his commission on gross receipts, accepts outward charters at low rates on the plea of the expectation of good homeward freights, even when he knows that no such expectation can reasonably be entertained.[4]

[1] *Ec.*, 1912, i. 8.

[2] In language more plain but less in accord with the form of our analysis, the rendering of their characteristic service is only postponed and not irretrievably abandoned by restriction. An exception that supports this rule is furnished by rubber. (Cf. p. 23.)

[3] "Some extraordinary voyages were undertaken last year (1907). A steamer was sent from the Tyne to Java in ballast to load home at a very ordinary rate. When rates were very low from the River Plate in July, steamers were sent in ballast from the Plate to Java and Plate to Karachi to load home. A steamer was sent in ballast from the Plate to Natal, and then, finding the Indian market depressed, was sent on to Australia to load home."—J. White, Circular.

[4] The transfer of tonnage to more prudent owners by the foreclosure of mortgages led to some beneficial laying-up of tonnage in 1909. In the same year the compulsory "laying up" of a certain

The practicability of a policy of restriction depends of course largely on the facilities for combined action. Owing to its greater localisation,[1] the pig-iron trade is considerably better situated than the coal trade in this respect. The copper industry is less favourably situated than might be supposed. After the collapse of 1907, it was not until 1910, when the consumptive situation was already rapidly improving, that an arrangement for restriction was made between the Amalgamated and the Rio Tinto, and even then the result seems to have been small. The tramp-shipping trade is very badly organised: the rings and conferences into which the great lines are organised have never been extended with success to the tramps. Attempts at organisation have indeed been made; but even the more energetic of them, such as that concerned with the Baltic and White Sea trade, do not seem to have had any success in developing a common policy as to freights, still less as to building.[2] On the other hand, as is well known, the Lancashire cotton trade is exceptionally strongly organised with regard to the adoption of a common policy of short time.

Finally it must be pointed out that the "intractability" of the instrument not only aggravates the effect of such over-investment as has taken place, but also actually increases the temptation to over-investment. For the absence of a margin of idle productive power to draw on permits

amount of deadweight capacity owing to the adoption of an international load-line seems to have been a sensible relief to freights, just as the revision of the Free-board Tables, which added some 1½ millions to the tonnage in existence, had aggravated the depression in 1908.

[1] The centres of coal production are too widely distributed over the country to afford facilities for combined action (cf. Levy, *Monopoly and Competition*, p. 182): on the other hand, about 13 per cent. of the total output of pig-iron is produced in the South of Scotland and about 20 per cent. in the Cleveland district, and within these areas intercommunication is easy.

[2] Cf. *Ec.*, 1908, ii. 1,228. N.B. however the proposal recently mooted to impose a levy of 1*d.* a ton on all ships belonging to the International Shipping Federation, which, it is calculated, would suffice to compensate for the laying up of a million tons for a month (*Ec.*, Feb. 21, 1914).

a rise in exchange values to exercise its whole influence upon new investment. Further, the relative smallness of special costs which a high degree of intractability implies is an inducement to investment: for people are more ready to invest in instruments which they know they can immediately put into use without much additional expenditure and with a reasonable chance of covering working expenses. This consideration seems to be of special importance in shipping: for the depreciation of ships being due to the rapid progress of the technique of construction and to the liability to large falls in the "cost of reproduction" rather than to physical wear and tear, does not force itself upon the attention of owners, and allowance for it is apt to be relegated to the category of general costs for an indefinitely long period.[1]

§ 2. LONGEVITY OF THE INSTRUMENT.

The last characteristic to be considered is the longevity of the unit of investment. The normal length of life of the instruments of production might be expected to be an even more important determinant of the duration of depression than the ease with which they can be consigned to a living death. Indeed Karl Marx long ago suggested[2] that the alleged decennial character of crises was due to the fact that the average length of life of an instrument of production was ten years, so that at the end of that interval the need for replacement would automatically create a new demand for instrumental goods. This suggestion has not received much attention at the hands of subsequent writers, except for M. Aftalion,[3] who adopts it parenthetically, and M.

[1] In the recent boom, however, the steady rise of special costs, especially those of labour, insurance and provisions, seems to have exercised a deterrent effect on speculative building (*Times Shipping Supplement*, Dec. 13, 1912, p. 14).

[2] *Capital*, Vol. II. Part II. chap. ix. (Eng. Tr., p. 211). "... This cycle is determined by the lifetime, in other words by the period of reproduction or turnover, of the invested capital. ... One may assume that this life-cycle, in the essential branches of great industry, now averages ten years. ... This cycle furnishes a material basis for ... periodical commercial crises."

[3] *Journal d'Economie Politique*, 1909, p. 206.

Lescure,[1] who dismisses it with contempt. In the hands of Marx indeed it seems to have been little more than an ingenious guess, unsupported by evidence and invented to suit the facts: and as an explanation of *general* fluctuation it is open to obvious objections. It is clearly extremely improbable that the length of life of all the principal instruments of production should be the same.[2] Nor is the matter improved by Marx's qualification that it may be the period not of material life but of technical usefulness that is in question—that psychical depreciation as well as physical deterioration must be taken into account; for the inventions and improvements by which the instruments of production are superseded are obviously less likely to be uniform in their occurrence between trade and trade and period and period than the visitations of physical decay. Nevertheless there is considerable evidence in support of a careful application of the principle to particular trades.

The operation of the principle in its simplest form is as follows. Granted an initial rise in the exchange value of any product, there will follow, as we have seen, an abnormally large investment in the instruments of production. The approximately simultaneous wearing out of these instruments will produce an appreciable shortage of the product in question, reflected in a rise in its exchange value and leading to a fresh outburst of investment on an abnormal scale, followed by the usual results.

This analysis disposes at once of one objection to the theory of the importance of the length of life of the instrument. This comes from M. Lescure, who points out that the need for decennial renewals would not necessarily imply a special outburst of constructive activity every ten years. "The fixed capital A created in 1880 would be worn out and replaced in 1890, the fixed capital B created in 1881

[1] *Op. cit.*, p. 496.

[2] Marx indeed only contends for a mean of ten years: but unless the mean corresponds with the mode, there is no reason for any exceptional activity in the tenth year: and the only instance he offers of an actual ten year period is that of a locomotive (p. 201).

would be worn out and replaced in 1891 " [1]: there is nothing so far to prevent the process of investment from being perfectly uniform. But the theory does not profess to offer a complete explanation of the phenomena of fluctuation: it merely suggests, when taken in company with the theory of the period of gestation, that granted some single initial outburst of investment, the subsequent alternation of high and low prices tends to be self-perpetuating.

A second and more plausible objection is that the theory is irrelevant because it is quite clear that in fact the periods of exceptional activity in investment are periods not simply of replacement but of new construction. This objection in its crude form is rebutted by the reflection that in a competitive régime each producer feels bound to make his own arrangements to meet a rise, from whatever cause proceeding, in the exchange value of the product. But in fact it is clear in certain important cases that the wearing out of the instruments causes no such rise in exchange value, because it is physically necessary that the instruments be replaced before any shortage occurs: and further that the localisation of supply would make a rise in the exchange value of existing services irrelevant to investment policy elsewhere. In such cases, of which the railway industry is the most conspicuous instance, we must have recourse to that real but much-abused factor the " psychology of the business man." At the one extreme in this matter stands Mr. Hull, who regards the business man as an entirely rational and clear-headed expert, " not impelled by ' an organic defect of human nature,' nor by ' celestial influences,' nor by ' mental waves ' nor by ' sun spots,' but governed solely by plain, simple, unadorned business considerations." [2] At the other extreme stand those who appear to regard him as a wholly incalculable and irresponsible person, whose mental processes it is entirely beyond our power to analyse. But it is clearly possible to hold that while a business man's actions are often not rational, they are nevertheless very

[1] *Op. cit.*, p. 497.
[2] *Op. cit.*, p. 126.

seldom wholly incalculable in the sense that they are not provoked by any external stimulus: they may be the result of non-rational or only semi-rational inference [1] from the actions of other people or from other observed facts. Now if a business man sees other business men making extensive purchases for renewals, it is likely to arouse in him a not wholly rational feeling of optimism, which will tempt him to engage in new enterprises of a similar character. He may perhaps have been planning such an enterprise for some time, watching a gradual growth of demand and maturing his designs: but in any case the rush for renewals will be the factor which actually determines the moment at which his designs are put into effect.[2]

It remains to apply this principle in detail to particular industries. The late editor of the *Reports of the British Iron Trade Association*[3] estimates the average life of an iron rail at ten years. And the only instrument for which Marx is definitely prepared to assert a ten years' life is the railway

[1] Cf. Graham Wallas, *Human Nature in Politics*, pp. 98 ff.

[2] The suggestion may be made clearer by an analogy from other fields. The modern method of treating many diseases is by injecting a culture of the patient's own blood which has been sterilized. The patient's white corpuscles first attack the dead germs in the culture, and then encouraged by their easy victory advance against the live germs in the remainder of the blood. It is not clear to the outsider why they should not do this at once; but the psychology of phagocytes, like that of business men, is an obscure but no doubt a fascinating study.

Or we may compare the manner in which the ancient Romans introduced little runnels of fresh water into the Cloaca Maxima, thereby stimulating the flow of the inert mass.

It should be noted that while the business man's action is not wholly rational, neither is it wholly irrational. In the first place the mere fact that other people think it worth while to replace their plant on a large scale instead of letting it fall into disuse is *pro tanto* an indication that the industry is in a good condition and the moment favourable for investment. In so far as he is uncertain, as he may well be in some cases, whether the new orders are for renewals or for new construction, the effect of this consideration is enhanced. In the second place when he sees the flood of new orders he will anticipate a rise in costs and conclude that if he is going to invest at all the sooner he does so the better (cf. chap. iii. § 2).

[3] Review of 1878, introduction.

locomotive. It seems possible that this throws some light on the successive outbursts of English railway investment, which (comparing Table II with our hypothesis of a two-years' period of gestation) we must date at 1834, 1844, 1854, 1863, the last revival being hastened by the Joint-Stock Acts,[1] just as we find an intermediate revival in 1860 precipitated by the Limited Liability Act of 1859 and telling on the mileage of 1862.[2] In the mileage expansions of

[1] Cf. chap. i. § 2.

[2] If we may suppose the life of a rail to begin in the same year as the railroad is authorised, i.e., if production follows thus quickly upon investment, the theory stands; but if, as seems in some ways more likely, we should regard its life as beginning in the year between authorisation and opening, we must postulate a nine years' life, and revise the dates as follows:—

First large output of rails	1835	renewed in	1844.
Second ,, ,,	1845	,,	1854.
Third ,, ,,	1855	,,	1864.

In this case we must suppose the large renewals spread over 1853–4 and 1862–3–4; and suppose that this dissipation did not appreciably affect matters in the first period, but was an additional cause of the prematurity of the boom in the second. If this account is correct the large rise in iron prices or production which is observable in 1844 and 1854 still more clearly owes its initial origin to renewals rather than to new construction. Cf. the following figures:—

	Pig-iron Production (Hull, *op. cit.*, p. 268).	Iron Price (Jevons, *Investigations in Currency and Finance*, p. 147. Index [1782 = 100]).
1843 . .	1,215,350 tons ..	43
1844 . .	1,999,608 ,, ..	43
1852 . .	2,701,000 ,, ..	40
1853 . .	(not available) ..	53
1854 . .	3,218,154 tons ..	60

The view that a large increase in the consumption for new building takes place in the year *following* a large increase in the consumption for renewals is confirmed by the following figures, belonging to a period where the life of the iron rail has ceased to be relevant.

	Steel Rails for renewals.	Steel Rails for new lines.
1877 . . .	240,427 ..	32,520
1878 . . .	330,282 ..	51,960
1879 . . .	116,653 ..	74,640
1880 . . .	231,229 ..	44,280
1881 . . .	391,881 ..	37,440
1882 . . .	453,866 ..	48,000

Brit. Iron Trade Assoc. Report of 1882, p. 122.

1868–9[1] and 1878–9 we have the harmonics of the series beginning with the invention of railways, and in those of 1872–4 and 1882[2] the harmonics of the series beginning with the extended facilities for joint-stock enterprise.[3] After this the life of the iron rail, of course, becomes irrelevant. I do not make this suggestion with any confidence, but I do not think it is entirely fanciful.

It is at least curious that for the machinery of cotton-spinning, the other industry which played a leading part in the English crises of the first part of the nineteenth century, Professor Taussig estimates an average life of ten years.[4] In Lancashire, at the present day, according to an expert informant, it is usual to write down the value of engines and boilers by 10 per cent. per annum. Machinery, however, is commonly written down $7\frac{1}{2}$ per cent., and it is possible that the thirteen-years' period thus suggested helps to explain the net decrease of spinning capacity in 1896 (thirteen years after the prosperity of 1883), its stagnation in 1903 (thirteen years after the maximum profits of 1890), and its very moderate increase, in spite of high profits, in 1912 (thirteen years after the maximum profits of 1899). (Cf. chart.)

I have no similar information for the woollen industry, but it is at least curious that the great booms in that trade

[1] Supposing the revival shown in the mileage of 1865–66 to have been prematurely cut short by the "joint-stock" crisis of 1866, and to have been resumed, without need of further stimulus from renewals, in the mileage of 1868–69.

[2] Though the substitution of steel for iron rails in the later seventies breaks the periodicity for ever, it would naturally in the first instance be most considerable in the years in which the greatest number of iron rails reached their natural term.

[3] There is indeed an alternative explanation of the shortening of the interval between successive booms—the deterioration in quality and wearing power of the iron rail. A writer in *Science* in 1872 (quoted in *Ec. H.* of that year) asserts that while the first English iron rails lasted 15–20 years, 8 years is now considered good, and the average is not above 3 to 6. I see no reason, however, for preferring these estimates to that of the Brit. Iron Trade Assn.

[4] *Quar. Jour. of Ec.*, 1908, p. 342.

in recent years arose in 1886, 1899 and 1912, i.e., at intervals of thirteen years.[1]

In the shipping trade also the length of life of the instrument throws light on some dark places in the history of the course of contracts for new construction.

The *Economist* of 1884 estimates the annual loss of tonnage from the British register at 5 per cent., of the total tonnage existing at the beginning of the year. At first sight this seems to correspond with the estimate given me by a Liverpool shipowner of twenty years as the average length of life of a vessel upon the British register. There are various reasons, however, for considering this estimate too large:—(1) The 1884 figures include only tonnage destroyed, not that transferred to other countries; (2) with a steadily growing tonnage an indication of the length of life of a vessel is given by the inverse of the fraction obtained by dividing the total loss in any year *not* by the tonnage in existence at the beginning of the year, but by the average tonnage in existence during a period, dating back from the said year, equal to the length of life in question.[2]

From the figures given in Table III, taking the average value of the formula in the footnote, we obtain an average length of life of 16·8 years. This result is confirmed by the figures given in Table IV. When we remember that in years of high freights (such as 1898–1900 and 1912) the foreign sales are naturally unusually large, and likely to

[1] There is perhaps a trace of another period in 1877, when in spite of the complaints of bad trade, it was generally affirmed that the amount of machinery in the industry was no longer excessive, though manufacturers were working it to the utmost. But the later harmonics of this series cannot be distinguished.

[2] If a is the amount on the register at the beginning of the year, b the total loss during the year, c the average annual net increase in tonnage (assumed to be uniform throughout the period), x the length of life, we get the formula:

$$\frac{1}{x} = \frac{b}{a - \frac{1}{2}xc} \quad \text{or} \quad x = \frac{a}{b + \frac{c}{2}}$$

contain an unusually large percentage of fairly new ships, and conversely in years of depression, such as 1908, we may with some confidence place the median of the 1885, 1890 and 1895 curves in 1901, 1906–7 and 1912 respectively, which, if we assume a correspondence of the median and the mode, corresponds admirably with our sixteen to seventeen years' period.

We shall then see in the large natural losses and sales of 1890–1 the harmonics of the large output of 1874; in the large natural losses of 1896–7 and sales of 1895 and 1898–9, those of the outburst of 1880–3; in the losses of 1903–5 the echoes of the great output of 1888–9; and in those of 1908–10 the echoes of 1891–2.[1] These considerations help to explain the revival of new contracts in the last quarters of 1890 and 1891, when the apex of the freight boom was passed: the curious increase, during the prevalence of low freights, in the second half of 1895 and the first half of 1896[2]: the similar phenomenon of 1904[3] and of the last quarter of 1908[4] and the first of 1909; as well as the first wave of the subsequent boom.[5]

Yet one or two more instances of some interest may be given. The coffee plant ceases to yield good crops after its

[1] The large foreign sales of 1900 must be attributed to high freights. But conversely both the sale and break-up of ships is precipitated by low freights; hence we may legitimately connect the large sales of 1895 with the 1880 boom, and the large "loss" of 1903 with 1888. Cf. Board of Trade Freight Index (1900 = 100).

1893	83·6	1896	79·4	1901	75·0
1894	79·8	1897	82·9	1902	70·7
1895	75·3	1900	100·0	1903	72·8

The high pre-1895 percentage for 1910 and the loud and general complaints and warnings of an over-supply of antiquated tonnage (cf. *Ec.*, 1910, i. 430, and *Moss Circular*, July 1, 1910), justify us in assuming that the ships eventually broken up in that year had had an unusually long life.

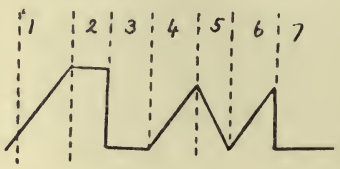
[2] Cf. *Ec.*, 1897, p. 12.

[3] Cf. *Id.*, 1904, p. 2138.

[4] Cf. *Id.*, 1908, ii. 1228.

[5] The expansion of orders in 1885 may also possibly be connected with the revival of 1868, though the "losses" of 1885 do not seem to have been unusually large.

twentieth year,[1] so that towards the end of this decade we may witness a falling-off of production due to the wearing out of the plants which caused the trouble at the end of last century. There is, of course, no uniform length of life for an oil-field; but Table I, combined with other evidence,[2] suggests that its typical history may be represented as follows:—



Stage 1 represents the gradual increase during the period of exploration, 2 the activity of spontaneous "gushers," 3 the exhaustion of the latter, 4 the gradual increase of production by pumping, 5 the natural exhaustion of the wells, 6 the desperate efforts by improved apparatus and new sinkings to postpone the evil day, 7 the final relapse into passivity. 1–4 are well represented by the Dutch Indies, 1901–6, and Mexico, 1907–11; 5–7 by the Appalachian field.

The simultaneous attainment of 5 by the Baku and Pennsylvanian wells [Table IA] led to the boom in the Scottish mineral oil trade in 1903, that of stage 6 to the relapse in 1904; but in 1906 their arrival at 7 and the simultaneous arrival of the Texas field at 3[3] led to a shortage which precipitated the first wave of the great oil boom.

Finally it should be observed that the almost infinite length of life (from a cyclical point of view) of the instrument of production of house room helps to explain the chronic stagnation of the building trade since the boom towards the end of the nineties—its failure to participate in

[1] Bartholomew's *Atlas of the World's Commerce*, p. 85.

[2] Cf. article on oil-supplies of Canada, *Daily Chronicle*, July 17, 1913.

[3] Cf. *Enc. Brit.*, Article "Petroleum."

the boom of 1906–7 and its reluctance to follow that of recent years. On the other hand, it is plausibly urged by the Land Enquiry Committee (vol. ii. p. 94) that in this case the mere fact of longevity induces an undesirable caution in investment policy.

CHAPTER III.

Fluctuations in Cost.

§ 1. COSTS AND CONSUMPTIVE INDUSTRY.

We have been concerned so far with certain tendencies towards fluctuation which, granted an initial rise in the exchange value of the services rendered by any trade, are found to be inherent in the modern system of large scale competitive capitalistic industry. Except, however, in discussing the longevity of the instrument, we have shed little light upon the possible causes of such a rise: and in fact most of our illustrations have been taken from cases in which the rise is due to a raising of demand for the finished product, the origin of which is not relevant to the subject of the present group of chapters. It is clear, however, that the rise in margins may proceed equally well from a fall in the costs of production: and further that, apart from all considerations of over-investment, a fall in margins and a depression in both the senses indicated on page 3 may result from a rise in the costs of production.

Abundant illustrations of this action of increased costs might be given from those industries which are dependent on annual harvests for their supplies of raw material. Thus the level of profits in the Lancashire cotton-spinning trade is largely affected by the size of the American crop and the consequent price of raw cotton (see Chart). For instance, the depression of 1910 was mainly due to the American crop shortage of 1909; conversely the big yields of 1889–90 worked in conjunction with a good demand to produce the record profits of 1890, and those of 1896–8 helped (in spite

of the temporary set-back noted below on page 50) to produce the boom culminating in 1899. Again in 1904 and 1911 large crops led to a sufficient fall in prices to permit the full effects of a good consumptive demand to make themselves felt in the spinning trade.[1]

In the jute trade also the effects of fluctuations in the crop upon manufacturing profits are important, and are aggravated by several influences. First, the fluctuations in the price of raw jute are enhanced by the wildness of the Indian Government's estimates of the growing crop.[2] Secondly, there is sometimes a tendency for a shortage of jute to coincide with a shortage of those products whose envelopment constitutes an important source of demand. Thus in India in 1908 the same drought which caused a shortage of the food-grains also reduced the length of the jute crop some inches below its standard six feet.[3] Again in 1910–1 the scarcity of jute was accompanied by a scarcity of some of its leading clients,—first cotton,[4] then American wheat, then Brazilian coffee: thus manufacturers were squeezed between high costs and low demand.

Again in the woollen trade, a shortage of supplies of the raw material led to a continuous rise of prices beginning in

[1] Cf. the revival in the volume of yarn exports to the continent in 1886 and 1894–5, and their decline in 1896.

[2] For instance, that of 1909 turned out to be 1½ million bales larger and that of 1910 half a million bales smaller than the final official estimate.

[3] *Review of Indian Trade*, 1908–9, p. 62. There was, however, a pronounced fall in price, caused by the increase (in response to the high demand of 1905–7) of acreage under jute from 3·1 m. acres in the seed time of 1905 to 3·9 m. acres in the seed time of 1907 (cf. *Stat. Abs. of India*, 1911, p. 126),—an increase which naturally aggravated the shortage of food-grains (*R. of I. T.*, 1906–7, pp. 36, 56). This compensatory action benefits Scottish makers, who are not affected by the conditions of Indian demand, and who in 1908 were enabled by the heavy Indian exports of raw jute (17·9 m. cwt. in 1908–9 as against 14·2 m. in 1907–8) to do a tolerable volume of business at the lower level of values.

[4] At the time of the civil war, jute and cotton were mainly rival, and jute profited largely by the cotton famine; but at the present day, when jute has successfully ousted cotton for ordinary packing purposes, the other relation is considerably the more important.

1868, and prevented the English manufacturing industry from sharing in the elation of trade in 1872–3; while the breaking in the season of 1904–5 of the long series of Australian droughts enabled it to take some share in the boom of 1906–7.[1]

Fluctuations arising from this source will clearly be less severe the more successful the attempts at inter-local and inter-temporal compensation,—in other words, the more numerous the independent sources of supply and the more efficient the distribution, by a speculative market or other means, of consumption through time.

With regard to the first point, the position of both the cotton and the jute[2] trades is exceptionally weak, though that of the former is no doubt improving. The recent work of the Lancashire Cotton Growers' Association and of other private and Governmental enterprise cannot be ignored; and it is said that there are now nearly eighty countries engaged in the cultivation of cotton, and that the area now coming under the plant in the new cotton countries is some thirty times as great as the whole cotton acreage of the United States.[3] Nevertheless the difficulties in the way are well known.[4] When there was a shortage of American supplies in the (calendar) year 1899, we were able to obtain 34·1 per cent. of our total imports from other countries; but when a similar event arose in 1910, the corresponding figure is only 25·5 per cent.[5] I think we must be careful for a long time to come not to exaggerate the relief from fluctuation which the industry is likely to experience from inter-local compensation with regard to supply.

[1] The three chief textiles—cotton, wool and jute—have all suffered from a rise in the cost of material in 1913.

[2] India is still for all practical purposes the sole producer.

[3] Cf. *London Chamber of Commerce Journal*, Dec. 1912, p. 367.

[4] It is, however, alleged, I know not with what truth, that a great part of the land hitherto devoted to the cultivation of the poppy in India is, unlike the rest of India, capable of producing a long staple cotton suitable for Lancashire consumption.

[5] For the two following years the percentages are 23·5 and 23·1. Computed from figures in *Stat. Abs. of U.K.* and *Ellison Circulars*.

With regard to compensation through time the cotton trade possesses, as is well known, a highly organised speculative market. A glance at the chart will show that the curve of estimated consumption is considerably more stable than that of imports,[1] i.e., that considerable stocks are held over in this country from year to year. Moreover, one further point deserves notice, because it seems to be of growing importance,—the increased tendency to hold up stocks in the country of production. For instance, in spite of the enormous production of the season 1911–2 and of a large bear influence the price of American cotton did not fall anything like so much as was anticipated, and spinners were disappointed. The reason appears to have been that merchants had made heavy short sales to spinners, and had covered by future contracts with persons who were in the main not speculators for the fall but the actual holders of the surplus of the vast 1911 crop. The volume of such contracts is said to have been three or four times as numerous as in previous years, and they extend often into 1915 and in some cases even until 1920.[2]

In this connection mention may be made of the proposal that has sometimes been put forward for the maintenance

[1] It should be noted that the figures, as given in the *Fiscal Blue Book* of 1909, p. 153, do not appear to be strictly comparable: for instance, the continued excess of consumption over net imports in 1893–6 and 1898–1903 is clearly inconsistent with the figures of stocks. Messrs. Ellison's net import figures appear to be somewhat larger than the Board of Trade's, but the trend of the two curves is sufficiently well shown.

[2] *Times* Financial Review of 1912. It may be suspected that throughout the first half of 1913 the same influence was still at work. "A moderate crop," said Messrs. Ellison in their circular of October, 1912, "will be amply sufficient for the world's requirements, while under a full yield values will have to seek a lower level." But by December the new crop had been estimated at 14½ million bales, or well over all previous records except that of 1911; yet spot prices of middling stood at 7·11*d.* or 1·02*d.* higher than the average for the season 1911–2. "With the near approach of a new planting season," Messrs. Ellison then said, "a material decline may easily be witnessed." Yet at the end of June, in spite of excellent prospects for the crop of 1913, values were still in the neighbourhood of 6·80*d.*

of some kind of common cotton reserve in Manchester, the trustees of which should be obliged to buy when cotton fell to (say) 4*d.* and sell when it rose to (say) 6*d.*[1] In any case it seems clear that in the cotton trade as elsewhere the forces making for better organisation and more complete inter-temporal compensation are likely to continue to grow in strength.

It must be noticed, however, that unless such inter-temporal compensation is *perfectly* effective, the claim commonly made that while increasing the frequency it lessens the severity of fluctuations,[2] is subject to important exceptions. For instance, in 1895, which was an unsatisfactory year from the point of view of sales,[3] spinning profits showed a respectable increase; for the unusually large stocks which, owing to the slackness of demand, were carried over from 1894–5 into 1895–6 were suddenly and largely increased in value at the end of the year owing to the not altogether anticipated shortage of the 1895–6 crop, and the credit side of the spinners' balance-sheets consequently swollen. The same thing occurred in 1900[4]: conversely at the beginning of 1898 the spinning trade showed signs of depression owing to the existence of stocks—not, however, it would appear very large ones—which were bought at the comparatively high prices of 1897 but had to be sold in the form of yarn at the low prices necessitated by the large crops of the season 1897–8.[5] In the jute trade the

[1] Cf. Oualid, *Journal d'Economie Politique*, Jan. 1912, pp. 58 ff., who justly contrasts such schemes with mere "valorisation" (such as that of coffee by the State of San Paulo), where the holder can continue to hold on a rising market.

[2] Cf. Emery, *Stock and Produce Exchanges*, p. 122.

[3] The rise in values induced a spirit of caution among Indian importers, and the volume of orders fell heavily (cf. *Ec.*, 1896, p. 38).

[4] Messrs. Ellison in their circular at the end of the year note "the refusal of calico consumers to buy goods on the basis of 5*d.* to 5½*d.* per lb. for raw cotton as freely as they had purchased on the basis of 3*d.* to 3½*d.*": but profits during the year were well maintained.

[5] *Ec.*, 1898, p. 5. The woollen industry suffered from the same trouble in 1880. Cf. also the manner in which the crisis of 1847 was precipitated by the very abundance of the English harvests,

increased intensity of fluctuation arising from this cause is even more serious ; for it would seem that the specialisation of the function of risk-taking has been carried much less far than in the cotton industry. The annual reports of the *Dundee Advertiser* (quoted in the *Economist* Histories) almost convey the impression that the whole energy of the spinner and manufacturer is absorbed in securing snap gains out of variations in the margin between raw material and cops, and between cops and piece-goods. And the profits arising from the appreciation of stocks have the same effect in stimulating investment as profits resting upon the more solid basis of lower costs,—a good illustration of the general principle that if one source of fluctuation is removed while another is left intact, the net result may in some cases be a decrease in stability.[1]

Finally, it may be noted that when two industries exercise a composite demand upon a common material, prosperity in the one tends naturally to produce depression in the other. Thus in 1913 the boot trade has been severely handicapped by the prosperity of the motor and fancy leather trades.[2] If we adopt the magnitude or relative magnitude of *profits* as the criterion of depression, the same applies to industries which draw upon a common labour supply. Thus the rise in the price of tin in 1911 was due to the rival attractions of the rubber plantations to the labourers in the Malay mines [3] : conversely in Germany in 1900 the textile industries benefited for a time by the supply of labour discharged from the iron and steel works.[4] Again the Scottish

which led to a violent depreciation of the heavy stocks of imported corn in the hands of Liverpool merchants. (Cunningham, *Growth of English Industry and Commerce*, Part II. p. 828.)

[1] Cf. Prof. Pigou's remarks (*Wealth and Welfare*, p. 110) on the effects of ignorance and lack of mobility upon the distribution of the supply of labour ; an indiscriminate cheapening of the costs of movement may encourage aimless shifting from job to job (cf. Edgworth's Review in *Econ. Jour.*, March, 1913).

[2] *Ec. H.* of 1913.

[3] *Ec.*, 1911, i. 206. It seems plausible to suggest that the simultaneous rise in coffee may have been due in part to an analogous situation in Brazil.

[4] Lescure, *op. cit.*, p. 206.

mineral oil companies lose (e.g., in 1907–8)[1] from the prosperity and gain (e.g., 1908–9)[1] from the depression of the coal trade: for their chief expense—shale miners' wages—fluctuates not with the conditions of their own industry but with the wages of coal-miners,—an arrangement which the men sought in vain to modify in 1903.

On the other hand, where there exists a condition of joint supply, the increased prosperity of a trade making use of one of the products leads to an increased prosperity, due to lowered costs, in the trade making use of the other. The most important illustration is the export trade in coal, which profits by the large supplies of tonnage required to assist in a boom of agricultural or other imports.[2] Especially favourable conditions seem to be such as prevailed, for instance, in 1891 and again in 1894, when the volume of total imports rose while that of exports fell, or rose to a much less extent, so that the hope of good homeward freights led to a large demand for coal with which to run out in ballast.[3] Thus freights from Odessa and Karachi, which stood at 11*s.* and 17*s.* on January 1, 1891, reached 35*s.* and 23*s.* by November and December respectively; cotton freights from New Orleans advanced during the year from 42*s.* 6*d.* to 47*s.* 6*d.*, and wood freights from Archangel

[1] Years ending April 30.

[2] In a rather different fashion the American pig-iron industry has been known, especially in the winter of 1897–8, to benefit at the expense of its English neighbour by a big cotton harvest, owing to the low rates for pig-iron to be carried as ballast in the cotton ships (*Ec.*, 1898, p. 3).

[3] *Economist* Index (quoted in 3rd Fiscal Blue Book, Cd. 4954 of 1909, p. 53) (1900 = 100)—

	Imports.	Exports.
1890	75	98
1891	77	93
1892	79	90
1893	77	88
1894	83	91

Exports of coal, etc.—

1890	30,142,839 tons.
1891	31,084,116 ,,
1893	29,031,955 ,,
1894	33,073,698 ,,

from 40*s.* to 50*s.*;[1] but coal freights declined in every direction.[2] Similarly the remarkable advance in the coal export trade in 1897 must be attributed in part to the large shipbuilding of 1896, coupled with a rise in the volume of imports and a fall in that of exports.[3] Moreover, owing to the length of the period of gestation, this reflex prosperity tends to survive that which gave it birth: thus in 1885, 1887, 1902–4 and 1908—years of poor demand for the services of the shipping trade—we again find coal maintaining or actually extending its export markets with the help of the competition of superfluous tonnage.[4]

§ 2. COSTS AND CONSTRUCTIONAL INDUSTRY.

Instances may also be found in constructional industries of the natural effect of increased costs in producing depression. For instance, a considerable part of the expenses of production of pig-iron consists in the cost of coal: hence, since contracts for coal are very rarely of more than twelve months' duration, we should expect to find some signs of diminished activity in pig-iron within a year of the

[1] *Vide* tables from *Glasgow Herald*, quoted in *Ec. H.* of 1891, p. 36.

[2] *Vide* tables in Cd. 2337 of 1904, pp. 264–6.

[3] *Economist* Index (1900 = 100).

	Imports.	Exports.
1896	92	103
1897	94	102

Exports of coal, etc.—

1896	34,262,056 tons.
1897	37,096,918 ,,

[4] Exports of coal, coke, and manufactured fuel—

1884	23,350,230 tons.
1885	23,770,957 ,,
1886	23,283,389 ,,
1887	24,460,967 ,,

Exports of coal only (excluding bunkers)—

1901	41,877,081 tons.
1902	43,159,046 ,,
1903	44,950,057 ,,
1904	46,255,547 ,,
1906	55,599,771 ,,
1907	63,600,947 ,,
1908	62,547,175 ,,

establishment of a high level of coal prices. And this is in fact the case. The price of coal began to rise appreciably in 1882 and the production of pig-iron was curtailed by 1883. Large rises occurred in 1888–9 and 1898–9, and in each case the activity of the pig-iron industry began to wane in the latter year; and there is no doubt that the famine coal prices of 1900 were a serious check to the iron industry. Similarly the price of coal began to revive in 1906, and the check to pig-iron production came early in 1907.[1]

Evidence of the stimulating effect of low costs may be found in the shipbuilding industry. Thus in the autumn of 1887 one of the impulses to the placing of new orders was the comparative cheapness of iron after the collapse of the American railway demand. Again the little speculative spurts of 1897–8[2] and later 1908–early 1909[3] are referred by contemporary observers to the same source. Messrs. Moss give the same explanation of the increase in 1905[4]

[1] Moreover on all but the first of these occasions, stocks of pig-iron continued to decrease after the break in production, which affords some ground for inferring that the check to productive activity came not from the side of demand but from the side of costs, since consumption was not reduced to an equivalent extent. Cf. the following figures of stocks on December 31 (*Reports of Brit. Iron Trade Ass.*).

1888	2,588,708 tons.
1889	1,951,443 ,,
1890	1,393,041 ,,
1898	945,307 ,,
1899	733,989 ,,
1900	456,419 ,,
1906	730,752 ,,
1907	221,885 ,,

The effect of abnormal increases of cost, such as that caused by the coal strike in March, 1912, scarcely needs comment.

The British iron trade is hampered also in times of boom by its dependence on Spanish and other foreign ores: in both these respects the American industry seems to be in a better position,—an additional cause of the later restriction of production in that country.

[2] *Economist History of* 1897.

[3] "Some far-seeing owners, especially on the Clyde, have been taking advantage of the very low prices." Moss *Circular* of July 1, 1909.

[4] *Circulars* of July 22, 1905, and February 6, 1906.

and of the aftermath in 1901.[1] It seems possible to invoke the same cause to help to explain the supplementary booms of 1891–2, and the temporary recovery in the first quarter of 1907. It appears, however, that in this respect some distinction must be made between the owners of tramps and the great liner companies. Thus the increase of tonnage under construction in the first quarter of 1901 is referred to purchases by the large companies on signs of a reduction in costs.[2] Again, in 1910: "In the majority of cases the steamers contracted for are on behalf of regular lines, which have taken advantage of the situation and placed their orders at rock-bottom prices."[3] But the great bulk of the orders which go to make up an ordinary shipbuilding boom are placed by tramp owners, and it does not appear that with them costs are usually the decisive factor.

For it does not by any means follow that variations in the cost of materials are the sole and sufficient explanation of the fluctuations of constructional industry. Since, however, this view is very strongly urged by two of the most important of recent writers on this subject, M. Lescure, the French theorist, and Mr. Hull, the American iron-master, who regard it as the key to the whole problem, it appears to be worthy of very close and detailed examination. Mr. Hull's suggestion is briefly that it is times of low prices of materials that are the real times of prosperity, for it is then that the majority of contracts for new construction are placed. But these contracts are undertaken independently of each other, and in ignorance of the limits of the available resources of constructional material. In the low-priced period these sources have been severely restricted, and the pressure of demand for the fulfilment of contracts produces a great rise in the price of materials. This rise discourages the formation of new contracts, the tide of which begins immediately to ebb. But the rise in prices continues for a time owing to the necessity of completing existing contracts,

[1] *Circular* of February 6, 1902. By this time costs had fallen 20 per cent. from the highest figures of 1900.

[2] *Circular* of July 6, 1901. [3] *Circular* of January 2, 1911.

and produces a spurious period of activity long after the genuine period of activity, as indicated by the volume of new contracts, has ceased.

Mr. Hull claims that this explanation is based on a long and " inside " knowledge of the United States iron industry, and it is therefore somewhat difficult for an outsider to dispute it. Nevertheless such definite data as are available are not always in complete accord with his view. For instance, in the boom of the early eighties he is obliged to assume, without explanation, a much longer period of incubation than on other occasions, since while the considerable advance in prices occurred in 1879, the volume of new construction continued to increase enormously till 1882.[1] It seems pretty clear that some of the vast railway mileage of 1882 must have been contracted for at the higher prices. Again the depression of the early nineties is an awkward period: for the price of iron declined steadily from 1890. Mr. Hull is obliged tocut the knot by stating boldly that there was no genuine industrial depression in these years, and by the introduction of a veritable Olympus of financial and political machine-deities. Industry was all right: it was only the Baring crisis, the 1893 panic, the Venezuela proclamation, Mr. Bryan's attack on the gold standard and what not that upset things,—all those extraneous circumstances in fact whose inadequacy as the cause of depression Mr. Hull elsewhere so strenuously asserts.

Again in explaining the collapse of 1907, the chief figures upon which he appears to rely are those of the building-permits issued in 1906–7 in fifty-seven cities, and those of the unfilled orders on the books of the Steel Corporation. As to the former, it appears that in the panic year 1907 the decrease in the value of buildings contracted for was about

[1]

	Average price of No. 1 Foundry (Philadelphia).	New railway mileage.
1878	$17·67	2,665
1879	$21·72	4,809
1880	$28·48	6,711
1881	$25·17	9,846
1882	$25·77	11,569
	(*Stat. Abs. U.S.A.*, 1912, p. 748.)	(*Ibid.*, p. 281.)

12 per cent. on that of the preceding year.[1] It is argued, on the unfounded assumption that the price of all construction materials rose as rapidly as iron,[2] that this represents a decrease in the *volume* of building contracts of 34 per cent. or even, on the further assumption that 58 per cent. of the total permits in each year were taken out in the months March–July, of 43 per cent. The inference, however, of the paramount importance of costs in determining the volume of construction does not appear conclusive. In the first place it is not clear from the bare figures that the decrease in construction was consequent on the very slight net rise in prices between January and May and not on the considerable fall May–December and the panic in October: moreover, it is to be noted that the considerable advance in prices took place in the last four months of *1906*. Secondly, even if we accept Mr. Hull's conclusions, the mere fact that so large a rise in prices could produce a fall of only 12 per cent. in the value of the work contracted for would seem to indicate that the elasticity of the demand for structures is not enormously great, and that a mere increase of costs would not suffice to produce those very large declines in receipts which depression appears to bring to *most* kinds of constructional industry.[3]

[1] *Industrial Depressions*, p. 183.

[2] While the average price of iron rose 21·66 per cent. (*op. cit.*, p. 184) the average price of all building materials only rose 8·39 per cent., and the average price of brick *fell* 27·45 per cent. (*Report of Bureau of Labour on Prices*, 1910).

[3] It may be observed further that according to the returns of the Geological Survey, for 52 cities, quoted in *Stat. Abs. U.S.A.*, 1912, pp. 224–5, the value of building permits fell in 1907 not by 12 but by just under 5 per cent. Indeed the whole series of these returns affords scant support to Mr. Hull.

	Value of Permits.	Average Price of Pig-iron (computed from Hull, *op. cii.*, Ap. 2).
1905	..645 m. $	$15·86
1906	679 ,,	$18·34
1907	646 ,,	$22·40
1908	566 ,,	$15·82
1909	771 ,,	$16·13
1910	726 ,,	$15·57

The figures of the Steel Corporation seem to be even less conclusive. A comparison of the monthly figures of pig-iron prices and the quarterly figures of unfilled orders on the Corporation's books shows that the two move almost invariably in the same sense—that a fall in prices synchronises with a falling off in orders and conversely. This relation is sufficiently well indicated by the chart (III) which I have drawn on the basis of Mr. Hull's figures. If we take for instance the expansion culminating in 1907, we find that the first considerable rise in the price-index (from 137·3 to 162), in the last quarter of 1904, was accompanied by an increase in the tonnage of contracts from 3,027,436 to 4,696,203; and that though a rise of price in the next quarter coincided with a slackening of the *rate of increase* of orders, an appreciable fall of price in the next from 179·6 to 174·3 was accompanied by an actual decrease in contracts of 767,905 tons. For the third quarter of 1905 the figures are inconclusive, for though they show a rise in tonnage of 964,278, they do not indicate whether this was entirely due to the fall in price from 168 to 161 in June to July, or whether it continued during the steady rise from 161 to 166 between July and September. During the last quarter, however, it is clear that the rise from 166 in September to 193 in December did not prevent a record increase of orders from 5,865,377 to 7,605,086 tons. Price broke in January and continued to fall till June, and with it the volume of contracts: but the latter increased rapidly in the third quarter of 1906, in spite of a rise in price from 186 to 194·3, and continued to expand, though more slowly, in spite of the phenomenal rise from 206 in September to 272 in December. During the first half of 1907 prices remained about stationary, with a tendency to fall; so did the volume of contracts. In the second half of the year prices fell at an accelerating rate: so did contracts. In spite of a continued price fall through the first half of 1908

It is, however, fair to point out that in 1909 and 1910 the price-movements determining the character of the year took place in the *autumn*.

contracts refused to revive till the third quarter, and continued to revive in the fourth quarter in spite of a new rise in price.

I do not think this analysis can fairly be said to support Mr. Hull's argument in its extreme form. In particular it seems to suggest two objections. In the first place if costs are the sole consideration, why is the revival of investment so long delayed after the first break in prices? If the hard-headed and infallible business man in whom we are asked to believe found it profitable to increase his orders in November, 1906, when iron was at $22·93, why did he not find it profitable to do the same when iron had relapsed to the same figure in July, 1907? And here it must be remarked once for all that it is no answer to say that on a falling market he will naturally wait till prices are at a minimum. This is obviously reasoning in a circle, for a minimum, like virtue, is one of the things the beauty of which is only realised when it has been left behind. Prices only turn out to have been a minimum because business men have as a matter of fact for some reason chosen that moment at which to come in and buy, and have therefore sent prices up.

This objection is supported by a reference to the British coal and pig-iron industries.

While	the price of coal fell steadily from	. . . .	1873-6	the production of pig-iron did not begin to revive till	. . .	1876
Do.	do.	do.	1876–9	Do.	do.	the end of	1879
Do.	do.	do.	1884–6	Do.	do.	do.	1886
Do.	do.	do.	1891–3	Do.	do.	do.	1893

It is true that in 1876, and again in 1902–3, a spurt in pig-iron production intervened in the downward course of coal, but in neither case was the continued fall in coal prices able to prevent the subsequent relapse in the activity of iron: and while coal continued to fall throughout 1903–5, the production of pig-iron did not take a fresh start till the end of 1905. Again the price of coal began to decline from November, 1907, but the production of pig-iron did not

begin to revive till the autumn of 1909. The interval in this case is shorter than on previous occasions, but even allowing for the existence of twelve months' contracts at high prices, it still appears sufficiently long to require explanation. It appears then that though low costs constitute a condition favourable to a revival of investment, they are not of themselves sufficient to determine the moment at which such a revival shall begin.

Secondly, even if high costs are ultimately the cause of the withholding of new orders, is it not clear that they can prevail for a considerable time without exercising any effective deterrent influence upon investment? Do not such events as those of the latter half of 1906 force one to conclude that people do as a matter of fact continue to buy heavily on a rising market from choice and not merely from the necessity of fulfilling contracts? The study of shipbuilding seems to confirm this view. We read, it is true, that in 1882 there was "some tendency towards a slackening of orders,"[1] owing not indeed exactly to high costs but to the impossibility of promising delivery under fifteen months. Nevertheless there was a new increase in contracts in the last quarter of that year and in the first quarter of 1883. Again in the recent expansion costs were on January 1, 1912, 15 per cent., and on January 1, 1913,[2] 40 per cent. above those of January 1, 1911, yet the tide of orders continued an almost unbroken increase throughout 1911 and 1912. We cannot do without the supposition that in all these cases there was some force at work sufficient to overbear the deterrent influence of high costs.[3]

[1] *Economist History* of 1882.

[2] Moss *Circulars* of those dates.

[3] The evidence of the copper trade in 1899 is exceptionally interesting. The exactions of the newly-formed Amalgamated Copper Company, which started by controlling one-half of the American (i.e., one-quarter of the world's) production, and was soon able to dictate the world price, raised the price of standard to a maximum of £79 10s., on May 16; and though it declined thence to £67 in December, the level was so high that consumption in 1899 fell 16 per cent. in England, 5 per cent. in France, and 8½ per cent. in Germany. (First ten months.) (*Ec.*, 1899, p. 1811.) (If electrical enterprise was not correspondingly restricted, it was thanks to the

Indeed it seems that on certain occasions rising costs are actually an attractive force in stimulating new construction. Thus the first impulse to new shipbuilding in the autumn of 1879 appears to have been largely fear of the effect upon the iron market of the rising American demand for railway material. Similarly the rise in the volume of orders for new ships in the autumn of 1887 was precipitated largely by the fact that speculative activity, which had for some months been amusing itself with copper and tin, had just devoted its attention with as little apparent reason to pig-iron. Again the little spurt in mercantile building in 1894 seems to have been due to the Admiralty demands at the beginning of the year and the consequent fear of dear material.[1]

In the main, however, it is confidence in spite of, not fear induced by, rising costs with which we have to reckon. And this leads on to a further inquiry: are excessive costs, even in the end, the determining factor in the ebb of constructional activity? Is it true, as Mr. Hull implies, that the rate of construction in a progressive community can never be excessive, or is it not clear that in a time of boom in any

substitution of aluminium, which though about twice the price per ton was in some ways more suitable, once initial difficulties were overcome.) But in Mr. Hull's own country consumption of copper increased 44 per cent.

[1] Cf. *Ec. Histories* of those years. Parallels can be found in consumptive industry: thus it was a shortage of South American supplies, aggravated by a sudden speculative rush of French buyers, which initiated the boom in the English woollen industry in 1886; just as the later boom of 1899 was accentuated by two successive shortages through drought in the Australian clip (cf. p. 27). Similarly it seems to have been partly a fear of shortage instilled by the strong Continental inquiry that impelled Indian importers of cotton goods to make their large speculative purchases in 1889 and 1907 (cf. p. 107).

It is odd that Professor E. D. Jones, in his careful study of the psychological aspect of fluctuations, neglects altogether the importance of *fear* as an incentive to increased activity (*Economic Crises*, chap. ix. pp. 180–219). The point is well emphasised by Mr. G. Binney Dibblee (*The Laws of Supply and Demand*), who calls attention to it as a "reversal of Mill's law of value," e.g. (p. 140): "A further rise in price will not diminish demand; it may very likely increase it by drawing the attention of remoter buyers to the danger of a threatened scarcity."

industry there is a very real tendency to over-investment, and that many undertakings are started which cannot possibly pay their way?

To this Mr. Hull might fairly reply: "Yes, but that is only because the costs of construction were excessive; if the costs had remained at a normal level, there would have been no difficulty in obtaining a remunerative return." But this answer, it seems, would land him in a dilemma. Either the excessive costs are paid by what he calls the "holder of purse-strings," i.e., the ultimate owner of the instruments, or they are borne by the various intermediate contractors and producers of materials. Such figures as those of the Steel Corporation's contracts in the latter half of 1906 suggest that the former alternative is often the true one. Thus also Mr. Burton implies that the great depressions in American railroads were enhanced by the fact that the companies had bought their materials in the years of highest prices and had to compete with lines built when the prices were lower.[1] But to the extent that this is true the hard-headed and infallible entrepreneur on whom Mr. Hull's case depends, vanishes into thin air. On the other hand it seems probable that in many cases the costs are borne by various contractors and producers, because they have rendered themselves liable for contracts at the low prices. Thus Mr. Hull quotes from the report of the Empire Iron and Steel Company, Catasanqua, Pa., to the effect that its average profits for the years 1899–1907 were only $1·24 per ton, although during this period the price of pig-iron was three times advanced by an average amount of $11·71 per ton.[2] Similarly it appears that in the English boom of 1872 pig-iron manufacturers were mostly on contract at the lower prices and obtained little benefit from the great advance

[1] *Financial Crises*, pp. 84 ff.

[2] Mr. Hull makes it $12·70, but his arithmetic seems at fault. Even so a reference to the figures (*op. cit.*, p. 119) will show that the argument is far from conclusive, as the average profits over the nine years are naturally pulled down by the price depressions of 1901 and 1904–5. It appears that in 1907, while the average price of No. 1 Foundry at Philadelphia was $23·49, or 22·4 per cent.

in that year.[1] But in this case the costs to the ultimate entrepreneur have not been excessive, and the fact that many enterprises have to be abandoned while others fail to obtain a normal rate of return implies, on this hypothesis as on the last, that there has been a real over-investment.

This conclusion is, I think, sufficiently supported by the very facts to which Mr. Hull makes appeal: but it may be briefly illustrated from other industries. Thus in America in 1907 the price of copper (electrolytic) tumbled from 25½ cents in March till it reached 11¾ cents in October; but "even with the price cut in half, the demand for copper was sluggish, and it became clear that the diminishing consumption of copper was the fundamental factor in the situation."[2]

Again, while it is indeed possible that the initial slackening of shipbuilding orders in 1889–90, 1899–1900, and 1906 may have been due in part to increasing costs, the final debacle of these three booms is clearly incapable of such an explanation, since in each case costs had by this time fallen. For instance, costs fell 25 per cent. between July, 1901, and July, 1903[3]: the beginning of the fall was anterior to the collapse in new contracts, which its continuation was quite unable to arrest.[4]

above the average for the nine years, the net profit per ton was $2·20 or 77·4 per cent. above the average for the nine years: this does not look as if the company failed altogether to benefit by high prices! Yet, in spite of this unfortunate instance, the fact that makers are in many cases squeezed between high costs and long contracts at low prices is not, I think, in dispute.

[1] *Economist History* of 1872.

[2] Sprague, *History of Crises under the National Banking System* (U.S.A. Monetary Commission publication), p. 242. Indeed the cut in copper, preceding that in pig-iron, was on this occasion the first indication of the relapse in investors' demand.

[3] *Circular* of July 25, 1903.

[4] Indeed, the most cursory glance at the history of shipping and shipbuilding reveals the inadequacy of the cost theory as in any sense a complete explanation of their movements. That low costs are an advantage in construction and high costs a disadvantage is sufficiently plain: but that even tramp owners, whose psychological processes are admittedly obscure, should, however low the level of cost, maintain for long the rate of construction attained

While, however, a study of the facts suggests that those writers are wrong who lay exclusive emphasis on variations in costs as the cause of fluctuations in constructional industry, it does not follow that these variations do not play an important if subordinate past. It seems probable that they may be of importance in those tentative oscillations and false starts which precede the headlong rush of capital into investment, as well as in those partial recoveries which are sometimes observable after the first serious collapse.[1] In particular it seems possible that the bicephalous[2] nature of the American iron and steel expansion of 1898–1903 was in part due to this cause: that is to say, that over-investment in 1900 had not been so gross that a reduction of costs was not able quickly to stimulate a new flow.[3] Again in 1907 the price of pig-iron fell from January to April, but rose again in May to the highest point hitherto reached.[4] In England also the price broke first in February, but revived in April with a recrudescence in the demand from Germany and Austria, stimulated by the lower prices, but not destined to last much beyond the half-year.[5] Frequently, however, the influence of lowered costs only extends to the speculative market in half-finished products, and does not communicate itself to the purchasers of finished goods, who are more alive to the real situation.[6]

in times of boom is clearly neither possible nor desirable. In no case is it more clear than in that of shipbuilding that there are other factors at work more important than cost,—the fluctuations of demand for the final product, and the tendency to rash and ill-considered investment.

[1] Cf. Burton (*op. cit.*, p. 228), who attributes these recoveries to absorption by wider markets.

[2] Cf. p. 96 and Chart II.

[3] Thus there is no reason to dispute Mr. Hull's statement (*op. cit.*, p. 173) that "a great many individuals, firms, and corporations all over the country had plans and specifications of constructive work which had been prepared for them in 1899 and 1900, and which they had abandoned or postponed on account of the high prices then asked," but which were brought out again in 1901.

[4] *Vide* Chart II, and cf. *Economist*, 1907, pp. 823, 905.

[5] Cf. *Economist*, 1907, pp. 187, 582, 1139.

[6] Cf. *Times* (Financial sheet), July 7, 1913. There has been a rise in pig-iron prices in New York, but "merchant steel and finished

Moreover, the facts do not preclude us from believing that the *immediate* psychological stimulus to the cessation of new enterprise after the last or longest wave of expansion is sometimes afforded by high costs. It is quite possible that the fact uppermost in the consciousness of American business men in 1907 when they decided not to place new orders was the high level of costs. This is possible especially in the case of the initiators of railway enterprise, where the conditions of demand are particularly hard to gauge.[1] In England in the same year the manufacturers of materials do not seem to be clear as to whether the relapse in the demand for their products is primarily due to high costs or not. Thus in July Barrow simply reports a decline in the demand for hematite, both on home and foreign account: while "what Midland manufacturers say is that at present prices of pig and coal their quotations cannot be reduced to meet the ideas of consumers." Scottish malleable iron-makers are chiefly engaged on export orders, for "home consumers are not inclined to buy except in small quantities at current quotations, which have been raised by dear coal and pig-iron."

But in any case the argument suggests that on this and similar occasions the high costs were but a kind of alarum or pressure-gauge of unsound industrial conditions, which were bound in any case to make themselves felt before long: and that to blunt the industrial nerves with the narcotic of low prices would be as injudicious as it is, according to Dr. Sims Woodhead, to deaden with alcoholic liquor those sensations of hunger and fatigue which are nature's warning of the out-wear of the tissues.[2]

products have not followed the encouraging lead of the raw material. There it is not a question of coke or ore, but of orders from railroads."

[1] An expert like Mr. J. J. Hill may give it as his opinion that "Canada has about all the railways eight million people can support" (*Times*, July 9, 1913, p. 19), but owing to the stickiness of prices those actually engaged in railway enterprise are not likely to be very careful in their estimates of the relation of supply to demand: that indeed is one of the special dangers of this form of activity.

[2] *Cambridge Magazine*, January 25, 1913.

§ 3. INVENTION.

There is, however, one form in particular of lowered costs which seems to be of considerable importance both in inducing immediate prosperity and in stimulating the over-investment which sows the seeds of future depression; and that is a lowering of costs due to invention. It is indeed true that the effect of an invention is by no means always to raise at once the net receipts of those engaged in the group of trades in which it is introduced. For in the first place the depression among those firms which cannot or do not introduce the new process may outweigh altogether the prosperity of those firms which do. Thus the introduction in the seventies of the Bessemer process of steel manufacture led to a prolonged and acute depression in the puddled iron trade.[1] Secondly, the economies of the new process may be anticipated rather than actual. Thus on the same occasion those firms which took up steel manufacture seem at first to have done little better than the rest, and the new process, according to the *Statist* history, "aggravated a depressed trade by the severe losses arising from the cost and uncertainties of a new manufacture." Similarly the adoption of motor-power by the London omnibus companies in 1905 led at first to a severe depression in their profits. Thirdly, while the exchange value per unit of output of the producers' services is raised, the superiority of the new product in efficiency and durability may be so great that their aggregate net receipts are considerably diminished. For instance, in the late seventies a steel ship of 1,700 tons required 17 per cent. less in weight of pig-iron[2] than an iron ship of the same dimensions, and was capable of doing 7 per cent. more work.[3] Similarly a few

[1] "The rapid development of the production of steel in better qualities and at lower prices has virtually superseded a large part of the iron-making establishments in this country," says the *Statist* history of 1877.

[2] In such cases the depression in the industry furnishing the raw material is of course still more acute: cf. the reports of the pig-iron industry in these years.

[3] Layton, *Introduction to Study of Prices*, p. 71. The situation

years ago the electric supply companies were hard hit by the invention of the metallic filament lamp, which at first reduced the consumption of electricity by two-thirds.[1] Again, recent inventions in the building trade, especially the ferro-concrete process, seem to have reduced on the balance the incomes of those employed in the trade.[2]

But the more usual effect of invention is to raise receipts and increase investment in the trade in which it is introduced.[3] There can be no doubt, for instance, that the iron and steel boom on the continent in the early eighties was due very largely to the invention of the basic process of steel manufacture, which first rendered available for industry the vast iron-ore deposits of Luxembourg and Lorraine,[4]

seems to have been especially severe in the rail industry, not so much for this reason (which would not be of importance till the superior length of life of the steel rail began to make itself felt) as because of the large quantities of scrap-iron rails thrown on the American market in 1878. Cf. the figures of English production.

	Iron and Steel Rails.
1878	633,733 tons.
1879	519,718 ,,

(Reports of Brit. Iron Trade Ass.). So also the increased use of self-actors, and of cotton-warps, which freed a number of spindles for the production of weft, contributed to the depression of the wool trade in 1875.

[1] *Ec.*, 1911, i. 209.

[2] The carpentering branch has been especially hard hit, but bricklayers and stonemasons are also affected (Dearle, *Unemployment in the London Building Trade*, pp. 46–8). Where, however, a piece of work is contracted for at a fixed price, the cheapening of construction enables more to be spent on panelling and fancy woodwork, etc., and these branches of the trade therefore prosper (*ibid.*, p. 53). In any case *profits* are of course at first increased.

[3] For the view that the harmful effects of invention are rare, and that as a rule not only the new trade prospers, but the old trade has ample time to "arrange its own funeral," see article on "Inventions and Investment," by Mr. T. C. Elder, in *Financial Review of Reviews*, July, 1912, p. 19.

[4] "In Germany the process is being steadily carried on at Herde, Ruhrort, Aix-la-Chapelle, Kaiserslautern and other places. The Herde Company have erected new and special works for the Gilchrist-Thomas process, which will be started in a month or so. Messrs. de Wendel and Messrs. Sturt have also erected new works, which will be started upon the process early in the spring" (Trade Circular apud *Ec. H.* of 1880).

and that the same discovery was a contributory if not a very important cause of the contemporary boom in this country.[1] The importance of the inventions of electrical power and oil-fuel in the transport and constructional booms culminating in 1900, 1907 and 1913 is also, I think, unquestioned, but is more conveniently dealt with in detail in other connections.[2] The German iron and steel boom of 1910–11 may here, however, be directly referred in part to the introduction of electric traction in the Lorraine district and the application of electric power to the production of steel direct from its low-grade ores.

[1] The *Economist* quotes an interesting account of the surprise and interest shown by iron makers at the first successful demonstrations of the new process in 1879; for the bowels of England were by no means innocent of basic ore. But while "the progress of the Gilchrist-Thomas process for the dephosphorisation of iron has been both steady and marked during 1880," it appears that it "has made greater advances on the Continent than in our own country," and the English steel boom seems to have been due in the main to other causes.

[2] Cf. especially Part II. chap. i. § 5. The importance of *legal* as well as physical inventions in stimulating investment is discussed in chap. i. § 2, *sub fin.*

The effect on various trades of fluctuations in the cost of credit facilities is best discussed in connection with the whole question of our monetary system (Part II. chap. iii. § 3).

B. PHENOMENA OF DEMAND.

CHAPTER IV.

Miscellaneous Changes in Demand.

§ 1. FASHIONS, WARS, AND TARIFFS.

The causes of fluctuation considered in the preceding chapters are all such as *might* arise in any industry without any change in the conditions of demand for its products. In fact, however, we have seen that the course of events is in many cases impossible to explain completely without recourse to the hypothesis of changes in demand; and we pass on now to consider the nature and causes of such changes.

Certain preliminary observations may be made. In the first place it has already become abundantly clear that fluctuations, due to conditions of supply, in a trade making consumable goods, involve fluctuations in demand for the services of trades making instrumental goods. All such questions concerning the relations between consumptive and constructional industry are, however, best deferred to the next book.

Secondly, though a change in demand is usually required to complete the explanation of a fluctuation, it is not necessary that that change should itself be of the nature of a fluctuation. Owing to the various temptations to over-investment, a single permanent elevation of demand is liable to produce an alternation of prosperity and depression.

Thirdly, if the growth of demand is of the nature not of a discontinuous leap but of a continuous advance, it may easily produce not merely one but a series of fluctuations.

This proposition follows naturally from the principle of the discontinuity of the process of investment. Further, the rise in exchange value in reality caused by the catching up of demand with permanent investment is liable to be attributed to an exceptional increase of demand, and so to accentuate each successive alternation of over-investment and depression. These considerations seem to be especially relevant where an initial stimulus to investment has been given by invention. It may, for instance, I think be plausibly argued that in Germany the iron and steel boom culminating in 1890 and the electrical boom culminating in 1907 were in large measure simply the harmonics of those of 1882 and 1900 respectively.[1] The two great inventions of basic steel manufacture and electric traction were too far-reaching to be satisfied, so to speak, with a single kill: after they had broken up their quarry of hopes and expectations, they were off again upon a fresh scent. Nor is this suggestion refuted by the fact that in 1887, though not in 1904, the German revival was apparently precipitated by that in the United States. For it is possible that the business man is not on the look-out for the moment at which demand can no longer be satisfied by existing structures, and allows it to pass by. It requires some external stimulus, perhaps of a wholly irrelevant kind, to attract his attention to it, and by this time investment is in arrear of demand. And postponement, by increasing the amount of legitimate investment, accentuates the appearance of an abnormal increase in demand, increases the temptation to miscalculation and so aggravates the boom and the subsequent depression.

It is, however, clear that in many cases we have to deal not merely with permanent increases, whether continuous or discontinuous, but with actual fluctuations of demand:

[1] It is for this, among other reasons, that Professor Pigou's self-imposed limitations in his study of fluctuations ("specific inventions are like enduring booms in Nature's bounty, and are not therefore of first-rate importance for the study of fluctuations") (*Wealth and Welfare*, p. 447, note) seems to me particularly regrettable.

and the nature and causes of such fluctuations seem to deserve a detailed study.[1]

We may first consider fluctuations arising from changes in fashion. It is, naturally enough, among the clothing trades that such fluctuations are most frequent and important. Thus the Bradford worsted trade was hard hit in 1881 by the change in fashion, initiated on the Continent, from lustre fabrics to fine soft wool—a change that did not touch the *woollen* districts, such as Huddersfield, which continued very cheerful. The depression of the same centre amid the general prosperity of 1898 was ascribed in part to the development of the taste for bicycling among the female sex, and the consequent demand for fewer and shorter dresses;[2] and in 1912 the Nottingham lace trade was still suffering from the malignity of the hobble skirt.[3] Among the luxury trades conspicuously to the fore in the recent boom were those of the cinematograph (paying anything up to 125 per cent.) and of the breeding of bull-dogs, dependent largely on the prosperity of the grinders of Sheffield.[4] The cotton trade benefited by, among other things, the discovery of a new thing in trousers by the cowboys of Mexico, and by the growing sophistication of the Chinese, who have taken to wearing cotton shirts with cuffs and collars.[5] Conversely the collapse of the Indian demand for cotton-goods in 1908 was aggravated by the curious fact that the year was regarded for religious reasons as an unlucky one, and a considerable number of marriages, with the large gifts of cotton cloth which the ceremony involves, postponed until a more propitious season.[6]

In the main, however, the fluctuations in the demand for

[1] I propose to omit altogether discussion of *seasonal* fluctuations in demand, as irrelevant to the purpose of this inquiry.

[2] *Ec. H.* of 1898.

[3] Cf. *Daily Mail*, Dec. 10, 1912.

[4] *Id.*, Dec. 7.

[5] *Id.*, Dec. 4. The same cause redounded, I am told, to the benefit of the sofa-stuffing and allied industries, owing to the importation from China of large quantities of discarded pig-tails at what may be called scrap-iron prices.

[6] *R. of I. T.*, 1908–9, p. 68.

articles of luxury seem to be merely the reflex of fluctuations in the profits of constructional and other industry.[1] And it will not, I think, be disputed that M. Issaieve is right in concluding [2] that in view of the fact that France, the great producer of luxuries, is much less severely affected by fluctuations than the producers of the great industrial staples, and that even in France only about $\frac{1}{2}\frac{1}{0}$ of the total volume of normal production is subject to the influences of fashion, the fluctuations of luxurious industry are not on the whole of first-rate importance to our main study.

Of more widespread importance are fluctuations in demand due to the alternations of war and peace and to the vagaries of foreign tariffs. With regard to the former, the armament industries occur naturally to the mind; but here indeed it seems that the conditions of armed peace bear so close a resemblance to those of war that we have to deal rather with an increasing expansion than with a series of fluctuations of demand. In so far, however, as the advance is discontinuous and spasmodic, the tendency to over-investment and a consequent slump is present: though indeed in this respect the indirect effects of Admiralty policy on the course of ordinary commercial enterprise[3] seem to be more important than the direct effect on those branches of industry specialising in armament work, who appear unfortunately to find the growing demands of Governments impossible to over-estimate.[4]

The effect of fluctuations in human hatred upon the course

[1] The American crisis of 1907 had a serious effect on the export of tulles from Calais, and threw 70 per cent. of the silk-workers of St. Etienne out of employment (Issaieve, *Journal d'Economie Politique*, 1893, pp. 666 ff.). The silk industry of Japan was also severely affected, with the result that Japan had to curtail its purchases of Lancashire cotton-goods (*Ec. Hist.* of 1908). The South African diamond industry was also hard hit; the value of the United States imports of precious stones which was $43,375,000 in December, 1906, sank to $207,000 in December, 1907.

[2] *Loc. cit.*

[3] Cf. pp. 61 and 159.

[4] Of important fluctuations due to a non-military Government demand, the best instance is perhaps the French constructional boom of the early '80's, due in no small measure to the Freycinet scheme of public works (Lescure, *op. cit.*, p. 149).

of fluctuation in the shipbuilding and allied industries through the medium of the demand for transport is perhaps more important. Thus the tremendous shipping, coal and shipbuilding booms in 1900 and the accompanying over-investment were in large measure due to the huge demand for tonnage for the conveyance of troops, stores, etc., to South Africa. Similarly in 1898 Atlantic and in 1912 Near Eastern freights were raised respectively by the Spanish-American and by the Tripolitan and Balkan wars.

Certain of the textile industries are markedly subject to similar influences. Thus in 1870–1 the woollen trade, and in 1900 the khaki manufacturers of Huddersfield, profited by large orders for army clothing, though on both occasions the *worsted* branch was severely injured by the closure of its normal markets. Moreover, on the first occasion at least the overflow on the restoration of peace of the dammed-up arrears of ordinary demand was treated as though it were a normal stream, and there was a rush of new capital into the trade.

The jute trade also has long had the reputation of being a darling of the war-god, and both the South African and the Japanese Wars brought a flood of orders to Dundee. But it is worth noting that a sudden military demand of this nature is not only likely to be short-lived, but also to create an excitement and an impulse to investment out of all proportion even to its temporary magnitude. Thus there is no doubt that in 1904 the impression prevailed that the jute trade was abnormally prosperous, and extensions of productive capacity were made from which the industry suffered for years: yet a reference to the figures will show that our exports both of yarns and piece-goods underwent a progressive fall in 1904–5. Similarly with the outbreak of war there was a hardening of Far Eastern freights and a flow of tonnage to the East to carry coal and to take the place of the Japanese merchant ships devoted to warlike purposes;[1] but the results proved to be disappointing,[2]

[1] Moss *Circular*, Feb. 20, 1904. [2] *Id.*, Sept. 30, 1904.

and by the autumn of 1904 the level of freights was very depressed. Even to his own minions Mars is often less generous than he seems.[1]

The Yorkshire woollen and worsted industry is perhaps the best example of a trade in which the course of fluctuation is much affected by variations in foreign fiscal policy. From 1890 to 1898 the export branch of the trade was kept in a continual state of upheaval by the distracting antics of the American tariff. A rush of imports before the McKinley Act in 1890 followed by a large falling off in 1891, an excessive reaction in the opposite direction in 1892, another rush in 1895 after the Wilson reduction followed by a renewed slump—another in anticipation of the Dingley Act in 1897 with the same sequel—all these led both to rapid oscillations in the actual volume of business done, and also, owing to the same liability as in the case of war to mistake abnormal deferred or anticipatory imports for a genuine increase in consumers' demand, to a marked extravagance in investment policy.[2] In 1914 the trade was expecting a rich harvest from the recent tariff reductions.

It is scarcely necessary to add that industrial no less than international disputes may dry up important sources of demand. Detailed illustration is superfluous, but we may instance the effect of the engineering disputes of 1897 and 1908 and of the transport strike of 1911 on the woollen trade.[3]

[1] A discussion of the broader effects of war on industry in general will be found in Book II. chap. ii. § 2.

[2] Similarly the collapse in 1907 of the Indian "Swadeshi" or Protectionist movement, whose activity had contributed to the decline in the volume of cotton imports in the previous year, swelled the huge speculative imports and investment of 1907. Cf. *R. of I. T.*, 1906–7, p. 14, and 1907–8, p. 24.

[3] The woollen trade was afflicted in 1911 by an extraordinary combination of miscellaneous disturbances of demand (excessive heat, transport strikes, European war-scares, Chinese revolution, hobble-skirts, Japanese tariffs and Turco-Italian War), some though not all of which were removed in 1912.

CHAPTER V.

Crop Volumes, Transport, and Construction.

§ 1. DIRECT INFLUENCE OF CROP VOLUME.

Of more persistent and widespread importance are fluctuations in demand arising from variations in the purchasing-power of those whose expenditure upon the products of the trade in question is directly or indirectly dependent upon the varying bounty of nature. Indeed it is well known that the most brilliant of all writers upon our subject, Stanley Jevons, thought to find in such variations the main origin of the whole phenomenon of industrial fluctuation.[1] The difficulties which are raised by this hypothesis of the dependence of industry in general upon crop conditions are well worthy of close examination: they do not, however, appear to affect the question of the dependence of single industries or groups of industries, and may therefore be postponed to the next book.

We may consider first such fluctuations as arise solely from variations in the *volume* of a particular agricultural product, irrespective of the effect of such changes in volume upon the purchasing-power in the hands either of producers or consumers.

Generally speaking the effect of an increased crop volume is to increase the demand both for land and sea transport, and so indirectly for the products of the iron and steel trades. With regard to land transport, for instance, the general view[2] is that the volume of the United States wheat crop

[1] *Investigations in Currency and Finance.*

[2] Cf. Piatt Andrew, "Influence of Crops on American Business," *Q. J. of Ec.*, Vol. XX. p. 343; and Mr. Finley, President of the Southern Railroad, in *Times* Commercial Review, 1912, p. 26

has an important effect upon the gross receipts of the railway companies and upon their orders for new rolling-stock and so forth. This contention is indeed not easy to establish statistically, and it is hotly disputed by Mr. Hull, who points out that in the year ending June 30, 1899 (a year, moreover, of record wheat-crop), agricultural products, according to the report of the Interstate Commerce Commission, formed only 11·33 per cent. of the total tonnage carried by the railroads. This evidence, however, seems to me very far from conclusive,[1] and on the whole I see no reason to doubt the correctness of the *primâ facie* view. The effect upon United States railway receipts of variations

[1] In the first place 11·33 per cent. seems a not altogether negligible proportion, and indicates a volume of traffic any large change in which would have a perceptible influence upon the total. Secondly the figures quoted are only those for traffic reported as originating on the road making the return. But it appears that such traffic forms a less proportion of the total tonnage carried by each line in the case of agricultural than of other produce. Thus in 1909–10, for example, the figures are as follows (*Stat. Abs. U.S.A.*, 1912, p. 298) :—

	Originating on Road.	Received from other Roads and Carriers.
Products of agriculture	78,736,507 tons	81,665,186 tons
Products of mines .	544,604,373 ,,	397,461,474 ,,
Total products . .	968,464,009	776,860,819

Moreover, in the absence of ton-mileage statistics for the different kinds of product, these figures seem to afford a fair indication that the average ton of agricultural produce is carried further and is of greater importance to the railways than the average ton of produce in general. Thirdly, a very large proportion (51·47 per cent. in the year 1898–9) of the traffic under consideration consists of the products of mines—coal, ore, sandstone, etc.—for which the average freight-charge per ton-mile is considerably lower than that for agricultural produce, so that again the mere tonnage statistics do not adequately represent the relative importance to the railways. Fourthly, coal, etc., are carried in open and agricultural products in covered cars, so that the indirect effect upon the iron industry of an increased traffic in the latter is greater. Fifthly, Mr. Hull's figures are for a year in the course of which the industrial revival had made great headway, and afford no proof that at its inception the relative importance of the crops was not greater, still less that the increased volume of mineral and manufacturing traffic was not itself originated in part at least by an increased volume of crops.

in the cotton crop (which is carried on the average a much shorter distance) and in the corn crop[1] (of which a very large proportion is consumed on the farm) seems, however, to be considerably less important than that of variations in the wheat crop.

An important exception to the general rule is furnished by India. Thus 1877 was a famine year in India, but our exports of iron and steel thither increased from 135,725 tons to 153,300 tons owing to an increased demand for railway material. Similarly in the famine years of the middle '90's, and again in 1902, the imports of iron and steel exhibited a considerable increase.[2] Again throughout the years of dearth 1907–8 there was a good demand from India for locomotives and other products of the English engineering trades.[3] The explanation is of course simple: in normal years a large part of the Indian grain-crops is consumed locally; but famine, especially the localised famine which is typical of India,[4] necessitates increased expenditure by Government in providing for a greatly increased transport of food-stuffs from district to district. In 1908, for example, the existing girders, etc., were found unable to bear the strain, and the Government was obliged at heavy cost to anticipate largely its renewal programme for 1909–10.[5]

[1] On the other hand, an important share in causing the depression of the U.S.A. railways in 1913 is attributed by the *Economist* (May 30, 1914) to the failure of the corn crop.

[2] Calendar Year.	Wheat Crop.	Rice Crop.	Iron and Steel Imports from U.K.
1895	134·7 m. cwts.	497·9 m. cwts.	314,306 tons
1896	106·7 ,,	415·3 ,,	464,377 ,,
1897	107·1 ,,	275·6 ,,	494,401 ,,
1898	143·9 ,,	498·3 ,,	388,035 ,,
1901	141·9 ,,	413·5 ,,	317,434 ,,
1902	121·8 ,,	384·3 ,,	374,906 ,,

[3] *Ec.*, 1909, i. p. 1,323; and *Histories* of 1907 and 1908.
[4] Cf. Atkinson, in *Stat. Jour.*, 1897, p. 98.
[5] *R. of I. T.*, 1908–9, pp. 25, 26.

The normal effect of a large crop volume in a country which grows for export is to raise the level of ocean freights and increase the orders for new ships. Thus the course of the English shipbuilding trade during the last forty years seems to have been largely determined by the fluctuations of the United States wheat crop and the consequent movements of North Atlantic freights.[1] It should be noted, however, that a large United States crop only exercises its full influence upon freights if accompanied by a shortage in the less distant sources of supply. Thus the French, Russian and British shortages of 1873 and the consequent necessity of an increased export from the abundant crops of the United States sent up Atlantic freights [2] and seems to have been largely responsible for the large shipbuilding output of 1874. Again in 1879 the failure of the French and English crops coinciding with a continued rise in American production seems to have been largely instrumental in starting the great shipbuilding outbreak of that and the following years. But the big United States crops of 1882 and 1884 were accompanied by plenty in Europe, and those of 1885 were bad. With a bad home harvest and good United States and Argentine crops in 1886 there was a slight increase in homeward Atlantic freights in that year and in tonnage under construction in the last quarter of 1886 and the first of 1887.[3] But the great impulse to shipbuilding in 1888 came from other sources; homeward rates from the United States, though they rose slightly by repercussion in 1888, did not advance greatly till the big harvest of 1889, accompanied by a Russian shortage, led to an

[1] The Board of Trade calculate that in the years 1884–1903 50 per cent. of the British tonnage entered with cargo at British ports was engaged in the North Atlantic trade, and weight their index-number of freights accordingly (Cd. 2337, cf. 1904, p. 2).

[2] Average wheat freights from New York to Liverpool rose from $7\frac{3}{4}d.$ per bushel in 1872 to $10\frac{9}{16}d.$ in 1873 (*Stat. Abs. U.S.A.*, 1912, p. 315).

[3] It should be noted that a big wheat output in the U.S.A. has its effect on the tonnage under construction in the last quarter, and one in the Argentine and in Russia in the first quarter of the calendar year.

increased carriage of grain across the Atlantic. But owners were by now on their guard, and there was no further increase in the tonnage under construction.

The boom in inward freights was checked by the good Western European and indifferent American harvests of 1890; but though the American crop of 1890 was small, a considerable proportion of it was exported, and though there was no rise in freights the activity of ship-builders seems to have been temporarily stimulated by this fact in the last quarter of 1890.[1] With more reason they were stimulated again one year later, when a phenomenal crop in America was accompanied by failures in Russia and France and by a poor out-turn in the United Kingdom. A poor U.S.A. crop in 1893 and European plenty in 1894–5 helped to keep freights at a low level, but in the cereal-year 1897–8 high rates in the North Atlantic and Eastern trades consequent on crop failures in Europe and large harvests in North America and India gave the impulse to the new ship-building boom; nor were the efforts of India and the big European crops of 1898 sufficient to prevent a large demand being made again on the enormous United States production of that year. In 1899 with big European crops there was a relapse in inward freights, reflected in a prolonged decline of the tonnage figures; and the great boom of 1900 must be referred to other causes. So great was the resultant over-supply of tonnage that even the large exports of grain from the U.S.A. consequent on their large crop and a Russian and Indian shortage could not prevent a drop of 74 per cent. in the grain rates from New York to Liverpool in 1901.

In the new century the situation has been changed by the decreasing proportion of the United States wheat crop used for export. But the wave of new contracts in the latter part of 1905 was, I think, precipitated by the large increase, after three successive years of shrinkage, in the United States wheat-crop, which gave rise to the very natural expectation of a large export. This expectation,

[1] See last note.

however, was not fulfilled, for only 7·99 per cent. of the crop was exported, as compared with 18·92 per cent. of the preceding crop and 41·36 per cent. of that of 1901.[1] Again the temporary revival in the first quarter of 1907[2] must be connected with the fact that of the record American wheat-crop of 1906 as much as 19·95 per cent. was exported—our own imports thence rising from 14·9 to 36·6 million cwts.

The American exports of grain diminished steadily in 1909–10, and their decreasing importance to shipbuilding is shown by the fact that in 1909–12 the most significant increases in new orders have been not as of old in the last but in the first quarters of the calendar years, i.e., at the time of the greatest activity in the Eastern trades. Homeward freights rose at last in 1911, but mainly by repercussion, for the crop was a poor one, and there was no large increase in exports; and though the exportable surplus of the big crop of 1912 has been considerably greater, the fact that the hypnotic influence of America, which seems so often to have blinded the vision of tramp-owners as of other British business men, was absent during the earlier stages of the present revival, may, I think, be regarded as a part explanation of the significant fact already noted that the main increase in tonnage contracted for in the last year or two has not been in tramp vessels at all.[3] Whether tramp-owners will preserve the same moderation in face of the large American crops of 1913 remains to be seen. The evidence of 1890, 1891 and 1907 points one way, that of 1889 and 1901 another, but the opinion may be hazarded that the spell has been broken for ever, and that what has been in the past the most fruitful source of the violent oscillations of the shipbuilding industry, has at last by bitter experience been eradicated.[4]

[1] Cf. *Stat. Abs. U.S.A.*, 1912, p. 563.

[2] It should be noted that tramp-owners had learnt their lesson, and that the flood of new orders was delayed till the large exportable surplus was no longer a matter of guesswork.

[3] Cf. note 2, p. 28.

[4] I purposely leave this passage as it was written in the summer of 1913, but the opinion here expressed seems to have been justi-

It must not be supposed however that even in the old century the trade was insensitive to every agricultural influence but the American wheat-crop. Thus the increased cereal exports of Russia in 1888 hardened freights not only in the Black Sea but also by diversion of tonnage in the Baltic and Mediterranean trades, and contributed materially to the shipbuilding boom. Similarly the revivals of contracts in the first quarters of 1891 and 1894 and in 1910 may be attributed largely to big Russian cereal exports.[1] Again the slight revival of contracts in early 1904 may be referred to the hardening in homeward freights from the Far East and the River Plate, both of which had two good crop seasons—a hardening accentuated in the former case by the record Australian crop of December 1903.[2] Again the great boom which began in the third quarter of 1909

fied. Our large imports of the U.S.A. wheat crop of 1913 were unable to stimulate even the freight market (depressed by the poor exports of corn and cotton), still less the tonnage under construction.

[1] Compare the course of Odessa freights. It has been noted that a big wheat output in the U.S.A. has its effect on the tonnage under construction in the last quarter, and one in the Argentine and in Russia in the first quarter of the calendar year. This consideration furnishes an additional explanation of the greater influence upon shipbuilding enterprise of an American than of a Russian increase in wheat production. The Russian crop being normally shipped later than the American, tramp-owners hang about in European waters well into the following calendar year before the shortage is revealed, and it is then too late to be of much use with the American shipments; while those disappointed with the results of the American trade in the autumn have a better chance of being in time for large Russian shipments in the spring. The period of transference alluded to in chap. i. § 1 exerts greater friction in one direction than in the other.

The expected gain to shipowners from the big Russian crops of 1913 has failed to materialise, owing to good harvests in the rest of Europe, and the holding up of the Russian supplies with the aid of a Government loan (*Times History*, Jan. 16, 1914).

[2] The Indian and Australian shortages in 1896–7 had the same paradoxical effect upon sea as the former had upon land transport, for they actually turned those countries into considerable importers, raised outward freights to the Far East, and so were mainly responsible for the increase in shipbuilding contracts in the last quarter of 1896 and the first half of 1897.

and progressed almost without interruption for more than three years seems to have been due initially (on the side of demand) mainly to agricultural influences in the Far East, the unexpectedly large proportion exported of the moderate Indian wheat crop of March 1909, the cereal prosperity of India and Australia in the two following harvests, and the springing-up of new trades from the Pacific,[1] of which the most important was the boom in Soya beans from Manchuria for cattle-feeding purposes.[2] It should be observed that owing to the length of the period of gestation the impact of several successive independent ripples of demand frequently exercises an effect upon the output of new ships which resembles that of one continuous and concentrated breaker.

Any attempt to estimate the relative importance to shipping and shipbuilding of the agricultural and the non-agricultural demand is necessarily difficult for an outsider. In 1888–9 high freights for timber from Canada and manufactured goods to the Argentine,[3] in 1906 the great boom in European emigration to the States and the carriage of steel, cement, etc., for the rebuilding of San Francisco, in 1910 the industrial development of Japan,[4] in 1912 the demand for oil-transport[5] was a valuable support to agri-

[1] Moss *Circular*, Jan. 1, 1910.

[2] Cf. *Economist*, 1909, ii. pp. 691 and 1,144, and 1910, i. p. 555. It should be noted that the import of this product was largely stimulated by the very shortage of the American cotton crop which depressed North Atlantic freights: a good illustration of the truth that the fulfilment of the law of inter-local compensation does not necessarily make for the stability of shipbuilding.

[3] The rise was sufficient to prevent the usual irruption of tonnage into the Russian grain trade (cf. note 1). Hence freights from Odessa rose from 11·9½ in 1887 to 15·4¾ in 1888, or 130·6 per cent. as compared with a maximum rise of 127·1 per cent. in freights from New York to Liverpool during the twenty years 1884–1903 —namely, from 2·47*d.* in 1890 to 3·14*d.* in 1891. Cf. also *Times Shipping Supplement*, Dec. 13, 1912, p. 14.

[4] The requirements of the Japanese and Chinese trades had been more than met for some years by the flood of Japanese merchant shipping and Russian captives available after the war (John White, *Review* of 1907).

[5] Cf. Part II. chap. i. § 5.

cultural influences.[1] As a rule, however, the non-agricultural seems merely to prolong and intensify the movement initiated by the agricultural demand.[2] I do not think we shall be convicted of error in assigning directly to agricultural causes a predominant influence over one of the most important and most fluctuating of British trades. The importance of this conclusion, in view of the unwillingness of most recent writers on fluctuation to admit the significance of agricultural factors, must be the excuse for the tedious length of this discussion.

The great encasing or enveloping trade must be treated together with the carrying trades in connection with the present argument. It would indeed seem that jute, "the world's wrapper," which is used for the envelopment of everything from cement and cotton to submarine cables and the legs of horses,[3] ought to be of all commodities the most beneficially affected by the soothing influence of the law of compensation. And indeed a reference to the figures of exports to the chief markets will show that in 1897 and 1902, for instance, the evil effects of the combined failure of the Argentine wheat and maize crops were in part—though only in part—compensated by the increased takings of Canada and the United States respectively, while in 1903–4 both Canada and the Argentine did their best to make up for the shortcomings of the United States. But on the whole the Dundee trade shows no great tendency to emancipation from the influence of the United States.[4] Our

[1] Cf. also p. 158, n. 2.

[2] Again a study of the Board of Trade Indices suggests that outward rates as a whole vary within somewhat narrower limits than inward; for a large part of our exports consists in manufactured goods which are carried by conference lines, in which the fluctuations in *volume* are relatively small, and for which the competition of tramps is unavailing, while the other chief item, coal, is one for which the demand, though elastic, is *relatively* invariable, and the freights for which therefore tend often to depend largely on the supply of tonnage called into existence by the requirements of the import trade.

[3] Cf. *Times Textile Supplement*, June, 1913.

[4] There has been a trans-cyclical diminution in the importance of the Argentine market, due to the competition of the Indian mills.

exports of piece-goods thither, though smaller than they were twenty years ago, still form about the same proportion, i.e., nearly 50 per cent., of the whole. Thus though America prevented the trade sharing in the general home depression of 1901–2 it helped also to prevent it sharing in the recovery of 1910–11. Nor could the "tolerably large business done" in 1908 by the home-trade, the Continent, Canada, the West Coast of South America and other markets, and the very large demand of the Argentine prevent the trade from complaining that "there is no new market to compensate for the loss of the American market." The export branch of the *spinning* trade is, however, chiefly affected by the agricultural conditions not of the United States but of Brazil, which takes about 40 per cent. of our yarn exports. A reference to Table V. will show that the volume of these exports follows very closely the movements of the coffee-crop discussed in chap. i. § 1.[1]

Finally, the volume of crops exercises in certain cases an appreciable influence on the coal trade: for by providing good homeward cargoes, a large crop lowers the outward freights which must be paid for coal. The extent to which the trade benefits depends upon the elasticity of demand for our coal in the country supplying the large crop. The contrast between South America and India in this respect is pointed out by Mr. D. A. Thomas, who remarks that our exports to the Argentine and Uruguay were larger in 1897 than in 1894 or 1900, though we only derived thence 1·23 per cent. of our wheaten-food supply in that year, as against 15·22 per cent. and 20·80 per cent. in the others: whereas in the case of India our coal exports show a clear tendency

[1] It should be observed that the holding up of the 1907 supplies did not affect the demand for jute, for it was a prominent feature of the scheme that the seven million odd bales of valorised coffee were kept not in Brazil but in the ports of Europe and the United States. In 1910 the demand furnished by the big current crop was apparently increased by a considerable exportation of stocks, for while the world's stocks decreased between December 1, 1909, and December 1, 1910, by some 2·8 million bags, the valorisation trustees only disposed of about 0·5 million.

to decrease with a decrease in our wheat imports.[1] In respect of elasticity the Russian demand appears to be similar to the Indian,[2] and the North American, which is at best inconsiderable, to the Argentine.

§ 2. PSYCHOLOGICAL INFLUENCE OF CROP VOLUMES.

The volume of crops seems also in certain cases to have an important indirect effect upon the demand for the products of the constructional industries. Variations in crop volume, whether or not they alter the volume of resources *available* for expenditure upon such products, may increase or diminish the psychological impulse to the *employment* of resources in this direction.

This consideration is of especial importance in the case of new and rapidly developing countries. In the Argentine and in Canada particularly, the most important effect of exceptionally good harvests upon our constructional industry has been through their operation as a psychological stimulus to English investors—a kind of guarantee or deposit on the hire-purchase system—a substance of things

[1] His figures are (*Stat. Jour.*, 1903, p. 456) :—

	Imports of Wheat, etc.	Exports of Coal.
1895 . . .	440 thousand tons	805 thousand tons
1896 . . .	106 ,, ,,	528 ,, ,,
1897 . . .	27 ,, ,,	195 ,, ,,
1898 . . .	477 ,, ,,	331 ,, ,,
1899 . . .	410 ,, ,,	433 ,, ,,
1900 . . .	[Insignificant]	100 ,, ,,

There seems, however, to have been an important exception in 1908, when coal freights were low owing to the scarcity of outward cargoes of manufactured goods due to the failure of the Indian harvests and demand, the return cargo being, as so often, hypothetical. Cf. *Review of Indian Trade*, 1908–9, p. 30, and the following figures of Indian coal imports :—

1906–7	257,203 tons
1907–8	308,348 ,,
1908–9	455,806 ,,

[2] Thus our large coal exports in 1890–1 (cf. note 3, p. 52) were conditional on low freights—the large Russian cereal exports of those years being not apparently accompanied by prosperity to producers.

hoped for and an evidence of things most emphatically not seen.

A glance at the curve of our iron and steel exports to the Argentine shows that maxima were reached in 1884, 1889, 1896, 1901, 1906 and 1909. The first of these booms seems to have begun in 1883 and to have been mainly a matter of railway construction.[1] The most noticeable feature of this expansion is that it seems to have both begun and ended later than the similar movement in other countries. It will be remembered that these were years of big crops throughout the world, and the Argentine was no exception.[2] Now while the very universality of the big crops prevented them, as is argued elsewhere, from stimulating American construction[3] or British shipbuilding,[4] in the Argentine, where the crops were important less for their own value than as an evidence of the capabilities of the country, no such hindrance arose; and that constructional boom whose absence from America Mr. Jevons so successfully explains [3] broke out, in the midst of constructional depression elsewhere, in the Argentine.

Again in the tremendous boom of 1887–9 it seems to have been partly the successful wheat crops of 1886–8 (exported in 1887–9) that stimulated confidence in the country's productivity. A connection of some kind will also be suspected between the enormously increased crop of 1893 and the import boom of 1895–6, the record crops of 1898–9 and the minor boom of 1900–1, the very successful harvests of 1902–4 and the boom of 1904–6,[5] the failure of 1905 and

[1] It was at the time that what is now the great Buenos Ayres and Pacific Railway was started, and of the country's increase in total mileage from 150 miles in 1874 to 2,290 in 1884, the greater part was constructed in the last two years. (Cf. W. A. Hirst, *Argentina*, pp. 181, 184.)

[2] I have no figures for production before 1887, but it appears that the exports of wheat rose from 700 quarters in 1881 and 8,000 in 1882 to 280,000 in 1883 and 500,000 in 1884.

[3] Cf. p. 153, note 1. [4] Cf. p. 78.

[5] The railway system increased from 10,285 miles in 1900 to 15,476 in 1908 (Hirst, *loc. cit.*); most of the increase seems to have been in 1904–6.

the collapse of 1907, the record crop of 1907 and the boom of 1909, the failures of 1908–10 and the heavy fall of 1910–2 and between the large crops of 1911–2 and the large increase in imports in last and (it may be anticipated) the current year. Now it will be noted that in general the curve of iron and steel imports tends to lag behind that of wheat exports by one year (and therefore that of wheat production by two years). This curious habit would afford food for reflection to an investigator of the rapidity of working of the mechanism by which the equation of international indebtedness is solved;[1] for our present purpose the variations from the habit are more significant. In the first two periods, those of 1882–4 and 1887–9, when the "psychological" element of the boom is likely to have been of the greatest relative importance, the import curve synchronises with that of wheat exports; in 1894–6, when the English investor was still smarting from the memory of the Baring disaster, and in no mind to listen to the Siren voices of the wheat-fields, not only was the import boom much less pronounced, but the period of lag was increased to two years. The inference that the influence of Argentine harvests upon the British constructional trades through the medium of the psychology of the British investor is of importance as well as their influence through the medium of the purchasing-power of the Argentine farmer is to this extent confirmed.

[1] The country appears to accumulate for a time its claims upon the foreigner. This is more marked when the increased resources are ultimately used in railway enterprise than when they are used mainly for the purchase of instruments, roofing material, etc., for a period of hoarding is not unlikely to precede the inception of the new design, and another interval elapses between the latter and the actual demand for rails. This seems to have been the case in the middle '90's; the railway mileage increased between 1890 and 1899 from 5,745 to 10,285 miles (Hirst, *loc. cit.*), and the large rise in English rail output in 1896 seems to have been largely designed for the Argentine.

Rail Output.

1894	598,530 tons
1895	604,338 ,,
1896	817,476 ,,

(Iron Trade Assocn. Reports).

A similar influence must be attributed to the boom in recent years in the Canadian crops. The results of the colossal borrowings of Canada on the security of her wheat-fields are discussed more fully in Part II. chap. ii. ; here it will suffice to note with regard to Canada in 1910–2 as with regard to the Argentine in 1887–9 that the more rapid rise of outward than of homeward freights[1] suggests that there are certain countries the emergence of which as an important source of our wheat supply has a greater effect upon our constructional industries than the actual magnitude of their contribution would seem to warrant.

[1] Between 1910 and 1912 average homeward freights from Canada rose from 34*s.* 6*d.* to 53*s.* 6*d.* per ton, or 55 per cent., while average outward freights rose from 32*s.* to 52*s.* 6*d.* or 64 per cent. (Memo. of Committee of Royal Colonial Institute, 1913).

CHAPTER VI.

Crop Values and Construction.

§ 1. NORMAL INFLUENCE OF CROP VALUES.

We now pass on from considerations of the volume of crops to considerations of their value. Without discussing at present whether or not an increased crop value represents a mere transference of wealth from consumer to producer, we may lay down the general proposition that it involves, other things being equal, an increased demand for the products of constructional industry.

This proposition is indeed disputed as regards the United States by Mr. Hull, who asserts [1] that while consumers would use increased resources in enlarging their general purchases, farmers would use it merely in paying off mortgages or in "laying field to field." With regard to the first statement, a fuller discussion of the magnitude and rapidity of the effect upon constructional industry of an increased demand for consumption goods must be deferred till later: but it may be remarked here that it is from the nature of the case less considerable than the effect of the direct use of resources in investment; for in the one case there is merely a stimulus to the use in construction of resources already accumulated, whereas in the other there is an actual increase in the volume of resources available for that use. As to the second statement, it appears to have escaped Mr. Hull's attention that the purchase of a field or the paying-off

[1] *Op. cit.*, p. 46. Thus also Mr. Hawtrey (*Good and Bad Trade*, p. 86) makes the extraordinary assumption that increased receipts due to a *diminished* crop will be simply hoarded, since the farmers' own immediate demand for labour will not be increased.

of a mortgage involves the transfer of a considerable lump-sum of purchasing power, which is now available for investment in the hands of the seller or the ex-mortgagee. Moreover, there seems to be good evidence that with a continuous growth in prosperity, American farmers have become a creditor rather than a debtor class.[1] Again the farmers' own demand both for repairs and renewals and for new purchases of buildings, agricultural implements and so forth, is by no means negligible. The importance of these considerations is enhanced when we count among the "producers" of corn, not only the actual growers but the whole tribe of transport agencies, elevator men and merchants, whose lending and investing capacity is thus increased.

On the other hand it is true that the growth among the Western populations generally both of the power and the opportunity to save—both of general wealth and of the facility for investment upon a small scale, tends to lessen the discrepancy between the use of resources in the hands of producers and of consumers. Nevertheless it seems probable that the increased resources of consumers will still be used mainly in other kinds of consumption, or that in so far as they are set aside for investment, the actual investment will be preceded by a period either of individual or of corporate hoarding; so that in either case the effect upon constructional industry will be less direct and immediate than that of equal resources in the hands of producers.

It seems indeed that exceptional cases must be admitted. In the hands, for instance, of the Indian ryot, living in backward up-country districts and making use of primitive methods of cultivation, or of the Russian farmer, who is inclined to hoard a considerable part of a good crop, as well as a considerable part of the proceeds of that part which is sold, an increased crop value may involve no perceptible rise in the demand for constructional goods—certainly a smaller rise than would an increase in the hands of the American capitalist farmer, whose crop can be turned into

[1] Piatt Andrew, *op. cit.*, p. 350.

money while it is still in the ground, and who will have ample opportunities to invest his increased earnings.

Similar differences prevail within the United States themselves. Thus a given increase in the cash-receipts of wheat farmers is likely to raise the demand for constructional goods more than an equal increase in those of cotton-planters.[1] For the methods of cultivation of cotton are from the nature of the plant more or less stationary, so that the planter is less likely than the wheat farmer to use increased resources upon the purchase of new machines and implements, especially as the wheat-farmer is often also a cattle owner, and likely to spend part of his increased receipts on wire fences, roofing for steadings, etc. Moreover, there seems to me reason to believe that the cotton planters, being partly men of negro origin,[2] are likely as a body to be inclined to spend more on immediate consumption and less on investment than the white wheat farmers.[3] Moreover, the actual variations in receipts from the wheat crop are likely to be greater than those in the receipts from other staple crops. For though there has been a marked trans-cyclical advance in the value of the cotton crop the year to year variations are, in consequence of the scarcity of other sources of supply and the consequent approximation to unity of the foreign elasticity of demand, comparatively small.[4] As to the corn crop, though the variations in farm value are very considerable, so large a proportion of the crop is consumed on the farm that they do not involve a proportionate variation in cash receipts. Since, however, a large volume of corn crop cheapens the cost of cattle-feeding, and since, moreover, it seems likely that the world's demand for beef is elastic, it might be expected that the

[1] On this whole subject, cf. Piatt Andrew, *Q. J. of Ec., loc. cit.*, and H. S. Jevons, *Causes of Unemployment*, chap. iii.

[2] Cf. Coman, *Industrial History of the United States*, p. 294.

[3] For instance, though a large cotton value was able to assist in staving off depression in the iron and steel trades in 1890 and 1900, it does not appear capable by itself of initiating a revival, as witness the years 1910–11.

[4] Piatt Andrew, *op. cit.*, p. 340.

volume of the corn crop, through the medium of the net profits of cattle-farming, should have an appreciable though dilatory effect upon the demand for constructional goods.

§ 2. PSYCHOLOGICAL INFLUENCE OF CROP VALUES.

The principle enunciated at the beginning of this chapter is, however, subject to an important modification. At the beginning indeed of a constructional expansion the "psychological" impulse to investment afforded by a large crop value is likely to reinforce, or even to compensate for the absence of the "psychological" impulse due to a large crop volume. For if the growers of crops find their resources enlarged and embark upon investment, it is not unlikely that an infectious spirit of confidence will get abroad which will impel other people also to enlarge their expenditure upon instrumental goods. But when the constructional boom is far advanced, a large crop value may actually have a deleterious effect upon the demand for constructional goods.

One reason, at the cost of some anticipation, must be sought in the relations of constructional and consumptive industry. At a time when little investment in new plant is being made by the manufacturers of consumable goods, a transference of resources from consumers to producers of agricultural produce will have little effect in checking such investment, since if the transference had not taken place, these manufacturers would have been chiefly occupied in getting more product out of existing plants. But at a time when manufacturers are investing on a large scale, such a transference of resources and the consequent decrease in the demand for consumable goods will have an immediate reaction, since it will quickly become plain that if the capacity even of existing plants is too great, there is no remunerative opening for further investment.

Another reason is to be found in the mechanism of a credit economy. If the general financial situation is on

the whole sound, or believed to be sound, advances are readily made against the crops, which thus create for themselves the currency which they require. For instance, in America in 1891 when there was a very large increase in wheat value as well as in volume, " the fine crops enabled bankers and merchants to keep money rates from advancing further, and to bolster up the market in order to unload their securities and merchandise." [1] Again in 1890 and 1900 the large sums required for financing the big cotton crops gave little embarrassment, for in the latter year general financial conditions were good, and in the former year, though there was a financial panic in November, the currency situation was temporarily eased by the passage of the silver coinage law. In 1903 and 1907, however, the increased values of wheat, and in 1903 the largely increased value of cotton, were due to shortage, which diminished confidence, already shaken by unsound industrial and financial conditions ; so that the money required for financing the crops was not created *ad hoc* but was to some extent at least withdrawn from other uses. In other words when bankers are thinking only about their security valuable crops are able to produce their full effect on the constructional industries : but when they are getting uneasy about their gold reserves, crop-carrying and loans to other investors become to some extent rivals.

It is clear that the deterrent effect of a big crop value on investment is likely to be most severe if the large value is due to shortage. It is possible, however, that if financial conditions are very shaky, the net effect upon constructional enterprise even of *large* crops which have a high value may be injurious. During a great part of the summer of 1913 it seemed to be a toss-up whether the large anticipated crop values would prolong or cut short the industrial boom in Canada. It was frequently heard that only a continuance of agricultural prosperity could prolong the expansion : but it was equally freely urged that the financing of the large crops would be a very severe strain on the situation

[1] R. W. Babson, *Business Barometers*, p. 148.

unless plentiful assistance were forthcoming from London. In the end it seems that the financial difficulties were tided over sufficiently well to allow the big crops to have a perceptibly steadying effect.

§ 3. DETAILED ILLUSTRATION FROM UNITED STATES AND GREAT BRITAIN.

These somewhat complicated propositions, as well as some of those laid down in the preceding chapter, can perhaps most conveniently be illustrated by a continuous narrative of the relations between crop conditions and constructional enterprise in the United States during the last thirty years (cf. Chart VI.). In 1886–7 the large volume and value of the wheat crop, following on two years of abundant corn, gave a great impetus, mainly through railway building, to pig-iron production. In 1888 the wheat volume was small, and the demand for railway transport correspondingly curtailed; but the value was large, and everything points to the fact that the activity in pig-iron would have continued to expand, but for the occurrence of that phenomenon, happily peculiar to the United States, of a "presidential year." [1] The iron prosperity of the following year may be put down partly to the delayed purchases with these large wheat receipts, partly to two years of abundant corn (1888–9). By the end of 1890 it seems as if considerable over-investment had taken place, and the crash that was due was almost precipitated by the failure of both wheat and corn crops.

As it was, the price and production of pig-iron fell off considerably in 1891, but a serious depression was postponed by the artificial stimulus of the McKinley Tariff and the Sherman Silver Law, by the large and valuable cotton

[1] The fact that the years of Presidential election—1884, 1888, 1892, 1896, 1900, 1904, 1908, 1912—were all except the last years either of depression or at least of stress and instability can hardly be entirely accidental: it seems pretty clear that this disturbing element, sometimes reinforcing and sometimes counteracting the influence of agricultural conditions, is of some importance.

crop of 1890, and by the enormous wheat and corn volumes and values of 1891. Pig-iron production accordingly took a new leap in 1892, but in that and the following year cereal and (to a less extent) cotton production were so bad that the averted depression was at length precipitated. In the autumn of 1894 the large volume of cotton, and in that of 1895 the large volume of corn, accompanied in both years by an increased volume of wheat, produced more or less speculative rises in the rate of pig-iron production, but the conditions of *value* were not favourable, and in 1896 there was a relapse. It was not till 1897 that the very large wheat value (due, it will be remembered, to abundance coinciding with a European shortage), accompanied by a large cotton value, and reinforcing two years of plentiful corn, was able to produce a genuine industrial revival, continued in the next year, especially through the medium of the railways, by the immense volumes of wheat and cotton. The revival, once on its way, was undeterred by the wheat and cotton relapses of 1899, but overtrading began, and in the latter half of 1900 there was a big drop in iron price and production, accentuated by a further fall in the wheat crop. The large values of corn and cotton however kept things going in the winter of 1900–1, and the enormous wheat volume and value of 1901 gave the impulse to a new wave of prosperity, which reached its culmination (with the help of the big corn crop of 1902) in June, 1903. The diminished crops of 1903 refused to support it longer, and depression followed until relieved by the record cotton crop and the large wheat value in the autumn of 1904. The new tide of activity was fed by very large cereal volumes and values in 1905–6, accompanied by a record cotton value of 1906. But by the end of 1906 it became clear that things were going too fast, and the diminished crops of 1907, though accompanied in the case of the two cereals by larger values, helped to deliver the *coup de grâce* in the autumn of 1907. The fair crops of 1908 mitigated the depression and the large wheat and cotton values of 1909 produced a new maximum of pig-iron

production, which however rapidly fell off with the poor wheat crop in the autumn of 1910: and it was not till the large and valuable wheat crop of 1912 was well in sight that the constructional prosperity of United States was fully set upon its legs again. But the shaky financial conditions of 1913, combined with the failure of the corn crop, prevented an increased wheat value from prolonging the constructional boom.[1]

The evidence thus supplied by the United States is perhaps sufficient to establish the general principles laid down in this and the preceding chapters. But a more detailed study of the effect upon the various British constructional trades of variations in the purchasing power of certain groups of agricultural producers seems to be of considerable historical and practical interest.

For a long time not only upon the shipbuilding but upon the iron and steel trades in general it was the influence of the United States that predominated. For instance, though it was the Russian demand for railway material that initiated the British iron boom in 1869, it was mainly the American demand that sustained it in 1870–1. Again in the autumn of 1879 it was the arrival in Sheffield of an order from Mr. Vanderbilt for 20,000 tons of rails that first raised the price of pig-iron. Much the same may be said of 1886, 1895, 1902 and 1909.

There are certain features, however, about the American market that call for attention. A glance at the chart of American construction (II.) will show two solid booms, culminating in 1872 and 1882, and followed by solid depressions: then an expansion with triple crests in 1887, 1890 and 1892, followed by a depression: then a kind of anacrusis in 1895, followed by an expansion with double

[1] The orders of the railway companies decreased by 50 per cent. in 1913, and the volume of unfilled orders on the books of the Steel Corporation declined from October 1912 (*Times History*, Jan. 16, 1914). The figures given by Mr. Hull in his appendices of the annual rate of monthly production and consumption of pig-iron appear to me to corroborate the crop theory by showing that the most characteristic movements of the curves take place in the harvest months.

crests in 1899 and 1902, followed by a depression: then a single expansion culminating in 1907 and followed by a depression: finally another anacrusis in 1909, followed after a prolonged dip by a genuine expansion in 1912–3. The quantity of our iron and steel exports to the United States rose from 1868 to 1871, fell till 1878 (with a slight recovery in 1877), rose enormously till 1880, fell in 1881, rose in 1882, fell till 1885, rose considerably to 1887, fell steadily till 1894, rose in 1895, fell to 1898, rose to 1902, fell till 1905, rose to 1907, fell in 1908, rose to 1910, fell in 1911–2 and rose in 1913. Thus the three solid American booms, both branches of the double one and the two anacruses, all had a marked effect on the British iron industry, and were on each occasion the first influence to wake it into new life. Of the Geryon of 1887–92 only the first crest made an appreciable impression on this side of the Atlantic, and the final expansion of 1912, while it imprinted its kiss upon England's forehead, was not destined to act the part of Prince Charming, but found the princess this time already wide awake. Again in some cases the influence of the United States, while predominant in the early stages of English constructional expansion, is before long withdrawn. Thus in the American booms of 1869–73, 1879–82, and 1887–92 respectively the English exports of iron and steel to the States reached their maxima in 1871, 1880 and 1887. On the other hand those of 1898–1902 and 1905–7 continued to exert an influence throughout their length.

These peculiar relations of English and American construction are partly to be explained by the following considerations. In the first place we observe in the earlier American expansions a marked tendency for the production of pig-iron to outrun its price. Thus while the price reached its maximum in September, 1872,[1] the production continued to increase in 1873: price reached a maximum in February, 1880, and production in 1882: price in January, 1887, and production in 1892. That is to say, the home production was after the first pressure amply capable of responding

[1] Philadelphia prices, quoted by Hull, *op. cit.*, Ap. A (2).

to the new demands, and the resort to English sources was only temporary. In the later periods the tendency has been less marked. Thus the price and the annual rate of the month's production [1] both reached a maximum in November, 1899; in 1902–3 the interval was seven months (November, 1902, to June, 1903) and in 1907 four months (February to June). It may be inferred that on these occasions, whether owing to natural difficulties or to trust action, the home supply was not so unrestrainedly responsive, and the pressure on foreign sources likely therefore, as we actually find, to be more prolonged.

Secondly, the different character of American constructional booms must be borne in mind. In almost every case the first outburst of energy seems to have been devoted to railways: but whereas in 1879–82, 1898–1903 and 1905–7 activity in railway building continued till the end of the boom, in the other periods it reached its maximum in 1871 and 1887 respectively, and the remainder of the expansion seems to have been mainly concerned with other kinds of construction. Now it does not appear that we have ever been able to rely on America furnishing us with a large market for other kinds of iron and steel goods besides pig-iron and rails; our superiority in other kinds of structural goods has not been sufficient to attract her, provided she can get enough pig-iron to make them herself. In 1872–3 and 1888–92, as we have seen, she could get more than enough: hence both the chief sources of the demand for English goods began to dry up with the slackening of the railway boom.

But while in a well-developed industrial country like the United States, fully capable of performing its own finishing operations, the effect of a revival upon British constructional industry is concentrated mainly upon the preliminary stage of manufacture—the production of pig-iron—in a new and mainly agricultural country the effect is likely to be more pronounced on the finishing industries. Thus in 1888–90, when the iron and steel

[1] Hull, *op. cit.*, Ap. D.

boom was largely due to Argentina and the American demand had subsided, it was the finishing industries that reaped the chief benefit.[1] Again in 1903–4 when pig-iron was depressed under the influence of reaction in the United States, both the quantity and value of our exports of such things as galvanised sheets, miscellaneous railway material, nails and screws, and almost all descriptions of agricultural, textile and other machinery, showed a continuous increase.[2] Moreover the revival in 1905, when American demand "though better was still sluggish" was in no small measure due to a demand for "thin and thick sheets for wagon-building and roofing in the colonies" and other distant countries.[3] Again in 1909 certain branches of the engineering trade, such as that of locomotive making,[4] seem to have been fairly prosperous early in the year, while pig-iron was still depressed, and the year as a whole was a record one for the export, among other things, of wire, galvanised

[1] Exports of:—

	Pig-iron.	Steel Ingots, Bars, and Blooms.	Railroad Material other than Rails.	Tinplates.	"Other Sorts."
	Tons.	Tons.	Tons.	Tons.	Tons.
1882 .	1,758,072	162,774	155,166	265,039	292,419
1889 .	1,190,371	85,764	331,957	430,650	411,387
	£	£	£	£	£
1882 .	4,962,185	1,861,109	1,245,689	4,642,125	3,930,181
1890 .	3,498,568	1,175,136	1,974,853	6,361,477	5,041,424

	Locomotives.	Textile and other Machinery.
1882 . . .	£919,988	£7,053,420
1890 . . .	£1,848,462	£10,582,603

[2] It is true that there were loud complaints of depression in the engineering trades, and that the unemployed percentage rose from 2·2 in 1900 to 4·4 in 1903 and 6·2 in 1904, but this was due mainly to depression in the home shipbuilding, textile and other trades. The demand for more or less finished iron and steel goods from the new agricultural countries made the real extent of depression in our constructional industry considerably less than might appear from concentration upon pig-iron.

[3] *Economist*, 1905, p. 1,546. [4] Cf. *Ec.*, 1909, i. p. 662.

sheets, " wrought tubes and pipes and fittings," " girders, beams, joists and pillars " [1]—records of which all but one were beaten in the following year, when the temporary United States boom had collapsed. From the beginning of 1910, moreover, the engineering unemployed figure began a prolonged fall, and the Sheffield steel industry entered on a new career of prosperity.[2] Meanwhile, the price of pig-iron remained stationary from January to April, and then fell, only rising at the end of the year : for again it was not the United States but the new wheat countries, Argentina and Canada, reinforced by Brazil the rubber exporter and South Africa at last recovering from her troubles, which among foreign countries were mainly responsible for the constructional revival of 1910–1.

So also in 1913, after the collapse of the American demand and the price of pig-iron, the Sheffield trade " recovered from the threatened reaction," and business in " tools, agricultural implements, saws, and foreign and colonial rail and railway requirements " remained good.

The growing importance of the new corn-raising countries suggests, therefore, that the current attribution to pig-iron of an almost sacramental position as the outward and visible sign of trade conditions in general—even of the conditions of constructional industry in general may need to be modified. This suggestion, which is indeed becoming a commonplace among economists, is confirmed by the reflection that not only has the other chief source of demand, the shipbuilding industry, become less sensitive to American conditions, but at no time has the price of pig-iron been morbidly amenable to its solicitations. It does not seem likely, for instance, that all the materials used in the enormous shipbuilding output of 1874 were contracted for at the prices of 1873 : yet there was a serious relapse in both manufactured and pig-iron prices in 1874. Again the aftermaths of 1891–2 and 1901 were not able to restore the prices of materials. Again while the average price of steel ship-plates rose from £6 4*s.* in 1887 to £6 14*s.* 7*d.*, in 1888

[1] *Id.*, 1910, i. p. 319.

[2] *Id.*, History of 1910.

and that of angles from £5 14*s.* 2*d.* to £6 3*s.* 2*d.*, that of pig-iron actually fell from £1 15*s.* 0·15*d.* to £1 12*s.* 5·66*d.*[1] Again in 1896 the price of pig lagged behind that of steel.[2] It seems as if the producers had got into the habit of answering mechanically to the United States stimulus, and were not on the look-out to take advantage of revivals in demand from other directions. Again pig-iron prices seem to have failed partly in 1910 and wholly in 1911 to profit by the increased shipbuilding, partly owing to the large quantities of scrap-iron from broken-up tonnage thrown upon the market.[3] Conversely the collapse of shipbuilding enterprise in 1902 and the consequent fall in the price of steel plates from £6 4*s.* 3*d.* to £5 14*s.*, and of angles from £5 19*s.* 9*d.* to £5 11*s.* 7*d.*, was not able to depress pig-iron prices in the face of the American demand.[4]

I say, therefore, that the traditional conception of pig-iron as the barometer of trade needs to be temporarily modified; yet not perhaps permanently. For side by side with the decreasing relative importance of America to English general constructional industry must be put its decreasing importance to the English pig-iron industry itself. We have already seen that the greater measure of control which has been obtained over American production prolongs the demand upon foreign sources. But the same factor, implying as it does the maintenance in times of depression of a larger reserve of unused capacity, and taken in conjunction with the colossal expansion in capacity in recent years, seems likely also progressively to lessen the

[1] Average Cleveland prices (*Report on Wholesale and Retail Prices*, 1903, pp. 28, 18).

[2] Cf. *Economist* history of that year. It is not clear, however, why the Board of Trade shows an actual fall in its index for the year: all the varieties which it quotes, except the declared export values, exhibit a rise. A similar lagging of pig-iron behind steel prices in 1882 is noticed by the British Iron Trade Association *Review* of that year.

[3] *Economist*, 1911, ii. p. 1,359.

[4] This is not of course to deny the importance of shipbuilding to the consumption of pig-iron, nor to its price in such years as 1889, 1899, 1906 and 1912.

urgency of the initial call. In the last decade, while pig-iron has still been largely at the call of America, and the rest of constructional industry mainly at that of other countries, pig-iron has necessarily been somewhat of a false prophet; but as it too becomes emancipated, it will come to reflect, as it did in 1910, more slowly but more accurately the genuine prospects of English construction —with something of the irritating serviceableness of a watch that is never far wrong but generally rather slow.

If our shipbuilding and finished iron and steel trades are not always affected in the same manner as our pig-iron industry by cereal conditions, still less is our coal trade. In the first place, the less highly finished the form taken by our iron and steel exports, the less the quantity of coal that goes to their making. Secondly, certain corn-raising countries, notably the United States, have always remained impervious to our coal trade: our exports of pig-iron thither are not followed up by exports of coal to assist in their further manufacture into instruments of production and in the operation of these instruments. For both these reasons those rises in the price of pig-iron which have been primarily due to American conditions, such as those of 1880, 1895, 1902 and 1909, have not been reflected in the price of coal: while in 1888–9, when the iron and steel boom was largely in finished goods, and cereal prosperity reigned not in the United States but in South America and Europe, our exports of coal were greatly increased, and the price rose earlier and more rapidly than that of pig-iron.[1]

[1] The importance of Russian agriculture to our coal trade in these and the following years is indicated by the following figures :—

	Russian Wheat Exports.	British Coal Exports.
1887 . .	10 m. qrs. ..	24
1888 . .	16 ,, ..	27
1889 . .	14 ,, ..	29
1890 . .	16 ,, ..	30
1891 . .	13 ,, ..	31
1892 . .	16 ,, ..	30
1893 . .	11 ,, ..	29
1894 . .	15 ,, ..	33

Again in 1913, the cereal prosperity of Russia, combined with

Finally there is one very important form of constructional industry to which the generalisation laid down at the beginning of this chapter does not seem to be entirely applicable, and that is the building trade. In the United States indeed, through the medium of the iron and steel and railway industries, a conection can be traced between the prosperity of cereal producers and of those engaged in the building trades. For first a revival of American constructional enterprise involves an immediate construction of brick buildings, and the price of brick—there being less reserve productive capacity in existence—rises even sooner (1898, 1901, 1904) or more markedly (1886, 1909) than that of iron. Secondly, there follows an immense flow of immigration creating a demand for house-room which leads to much speculative building.[1] But in England the influence of the prosperity of groups of cereal producers on the iron and steel trades works chiefly through the export and shipbuilding trades, and does not therefore involve a vast amount of terrene construction. In so far as the English building trade is affected by agricultural conditions, it seems to be through the medium of consumers rather than producers, and its further discussion must therefore be postponed to the next chapter.

a shortage of home supplies of coal and oil, has been of great benefit to our coal export trade.

[1] It will be noticed (Chart II.) that the curve of the average price of all building materials seems on the whole to be more sensitive to that of immigration than does that of brick, and may be inferred to be a better index of *domestic* building: compare their movements in 1889–90, in 1895, in 1899–1901, 1904, 1907, 1910–11. It tends to reach its maximum later than the brick curve, because the flood of immigration is prolonged at least as long as the iron boom lasts.

CHAPTER VII.

Crop Values and Consumption.

§ 1. CROP-PRODUCERS AND CONSUMPTIVE INDUSTRY.

The demand for certain important kinds of consumable goods seems also normally to be increased by the transference of resources to certain groups of agricultural producers. Thus there is evidence of a connection between cereal prosperity in America and the demand in that country for imported food-stuffs. The significance of the curve of *per capita* consumption of coffee [1] in each fiscal year (ending June 30) and of its relation with that of consumption [2] of pig-iron (see Chart XII.) will be discussed in other connections in later chapters: here it may be remarked that of the only four years in which the two curves show unmistakably a common upward movement,—1892, 1898,[3] 1902, 1907,—the first three were years in which the farm value of the wheat crop reached a maximum, and that of the only two years in which they move together downwards, one—1894—was a year in which it fell to the lowest point reached since esti-

[1] On the whole, I think as fair an index of general consuming power as any single commodity can be. The States absorb more than half of the world's production, and the *per capita* consumption is greater than in any other country except Sweden, Norway and Holland.

[2] Arrived at by adding the net imports of the fiscal year to the output of the previous calendar year, but not on the whole (cf. p. 96, n.) liable to serious error.

[3] The large coffee "consumption" of this and the previous year must, however, be referred partly to large importations in anticipation of the increased duties imposed by the Dingley Tariff late in the (calendar) year 1897.

mates became available. Further the divorce between the curves is more pronounced when, as in 1901 and 1904, the small wheat *volume* which helps to bring about a constructional check is accompanied by a larger value to growers, who thereby gain in purchasing power, than when, as in 1891, volume and value alike are reduced. The inference to be drawn is the considerable importance in the United States of the farming community not only as investors but as consumers.[1]

Again the influence of cereal and constructional prosperity in America on the Yorkshire woollen trade is easy to detect. The booms of that industry in 1867–70, 1879–81, 1886–90 and 1912–3 were largely export booms due to the American demand: while conversely the depression of the seventies was mainly caused by the failure of the American inquiry,[2] and in 1903–4 the collapse of the meteoric American demand of 1902 aggravated the difficulties of the trade. But on this occasion (as with the engineering trades) our other export markets, especially Canada, more than made up for the deficiency: and in 1909 the same agricultural advance of the new countries—notably Canada, South Africa and Australia,—which benefited certain branches of the engineering trade, made itself felt also on a number of miscellaneous consumptive products, such as chemical fertilisers, plate glass, leather gloves, paraffin wax, cycles, motors, ropes, soap, linen piece-goods, straw hats, paper-making materials, matches, leather boots and shoes and seed oils: of all of which our exports in this year beat all previous records.[3]

Finally, there are a few, though only a few, industries to

[1] In all respects the period centring about the collapse of 1907 is an exception: it seems that in this case the industrial boom had so far outstripped in magnitude the forces which helped to originate it that the fall in the value of the wheat crop of 1906 was not able to prevent a rise, nor a rise in the value of the wheat crop of 1907 to prevent a fall, in consumptive activity.

[2] The value of our woollen exports to the United States fell from £6·3 m. in 1872 to £1·4 m. in 1878; the *total quantity* of our woollen exports fell from 38·5 million pounds' worth in 1872 to 19·6 million pounds' worth reckoned at the prices of 1872, in 1878.

[3] Cf. *Stat. Abs. of U.K.* and *Economist*, 1910, i. p. 319.

which the prosperity of the home agricultural community is a factor of leading importance. Its influence, of course, is not unfelt in the boot and clothing trades, but it is completely overshadowed by other forces. But the proverbially eccentric course of the Scottish mineral oil trade seems often to have been dictated by the demands of home agriculturalists for its important by-product of sulphate of ammonia.[1]

§ 2. CROP-CONSUMERS AND CONSUMPTIVE INDUSTRY—INDIA.

But the course of English consumptive trade and industry as a whole seems to be influenced rather by variations in the available resources in the hands of certain groups of consumers than of certain groups of producers of agricultural produce. Among such groups the two most important are the population of India[2] and the working-classes at home.

The influence of the former is of course felt predominantly in the cotton trade. It is well known that the fortunes of Lancashire depend largely upon the abundance of the Indian rains and the consequent character of the grain-crops: but the precise nature of the connection has not always been made clear. The correct conclusion seems to

[1] Used as a top-dressing for the soil. Thus in 1902–3 (the year ends April 30), in spite of a slight decline in the price of most of their other products, the Scotch companies made the respectable profit of £192,000, while with the advance of "general" depression in 1903–4 their profits increased by £93,000. But in 1904–5, while "general trade" revived, the home harvest was bad, and the companies in spite of a policy of rigid economy and energetic improvement, could only increase their profits by £9,000. In 1909–10 and 1910–11 the demand for sulphate of ammonia was again their chief stand-by, and in 1911 it was reinforced by another consequence of the excellent harvest of that year, the growing demand for agricultural motor machinery. Cf. annual articles in the *Economist*: but cf. also p. 52.

[2] The exports to British India form about 40 per cent. of our total exports of piece-goods, and it will be noted that in almost every year the two curves move in the same direction.

me to be that the most important factor in stimulating cotton imports is a large production and a low price of rice, but that the influence of this factor is frequently modified by other agricultural phenomena and by the speculative character of the import trade in cotton goods.

Thus the cotton import booms of 1894, 1898–9, 1904[1] and 1910–1 are clearly to be connected with the large harvests and low price of rice in those years: and the slumps of 1892, 1897, 1900 and 1908 with shortage and famine prices. But the import booms of 1889–90, 1896, 1901, 1905–7 and 1912–3[2] seem to have been mainly speculative: and in 1902–3 and 1907 therefore, and even in 1895 (when the confidence of importers had not been without justification in rice conditions[3]) stocks were so large that heavily falling rice prices were prevented from exercising their due effect. But the speculative behaviour of importers is not always beyond the reach of explanation. For 1896 indeed no excuse is forthcoming:[4] but in 1901 and again in 1912 that large production and largely increased value of the exports of wheat, which (though prevented by previous speculation from influencing the movement of the import curve in 1891) had served well in 1886, 1888, 1898, 1904 and 1909–11, was reckoned at perhaps more than its true importance. Again in 1905 the rice crop was actually larger than in the previous year, and the rise in price was due to shortage of the minor rival food grains.[5] In 1906 a large rise in the export value of jute

[1] The rice crop indeed was not enormously large in 1904: but the price was driven down by the exceptional crops of wheat and of the minor food-grains.

[2] The *E. H.* of 1912 reports that the Indian stocks were very heavy—those in Bombay had doubled since a year ago.

[3] The imports of 1894 were, however, swollen by anticipation of a new duty.

[4] For 1889 and 1907 cf. p. 61, n.

[5] Numbers of the poorest inhabitants live habitually on these cheaper grains (millet, etc.), and regard rice in ordinary circumstances as a quasi-luxury (cf. Atkinson, *Income and Wealth of British India, Stat. Jour.*, 1902, p. 213; and for the difficulties in the way of substitution caused by the conservatism of consumers, *id.* in *Stat. Jour.*, 1897, p. 96).

gave confidence in the country's purchasing power : [1] just as in 1911 the slight rise in rice prices was due largely to shortage in China, Java, Japan, etc.,[2] and the increased prosperity of *exporters* seems to have compensated the diminished purchasing power of home consumers. On these occasions, therefore, the confidence of importers seems to have been not without justification.[3]

It is worth observing here that the weather conditions

[1] Cf. *R. of I. T.*, 1907–8, p. 33, and 1908–9, p. 46 : "For the third year in succession the salient feature of the Indian rice trade has been the strong internal demand and the curtailment of the exportable surplus. This surplus may be diminished either by poverty of out-turn in the yield itself or by shortage of other food grains for which rice may be substituted, or by exceptional prosperity and enhanced consuming-power among the cultivators of crops other than food grains, or by a disposition on the part of cultivators to grow such specially profitable crops in place of rice. All of these causes have operated in recent years, but such of them as depend on the exceptionally profitable cultivation of other crops have in 1908–9 been less operative than in either of the two previous years, seeing that the price of jute has very greatly fallen."

[2] *R. of I. T.*, 1911–12, p. 46. This was a disadvantage to the *Indian* cotton manufacturers, whose exports fell in the year 1911–12 by 16·0 per cent. in volume and 18·3 per cent. in value. It seems possible also (*ibid.*, p. 60) that owing to lack of resources the Indian industry recovers more slowly from depression than the English, so that the effect of a grain crop revival on the *English* industry is thus enhanced.

[3] The assumption, upon which the foregoing account is built, that the Indian demand for rice is normally inelastic, seems to be correct, and to be borne out by the following figures, which give the rice crop of each year multiplied by the average price of that year (the former in m. cwts., the latter as ratio of the 1873 price—the actual average prices are not given by the *Stat. Abs.*) :—

1901	757	1907	1,018
1902	638	1908	951
1903	760	1909	868
1904	641	1910	1,100
1905	758	1911	1,104
1906	922	1912	1,200

Of the exceptional years, 1910 is to be explained partly by export conditions, 1903 and 1910 partly by the demand of cotton growers, 1908 partly by the collapse of the demand of jute-growers. The annual computations of the *R. of I. T.* of the "sum saved" or "lost" by consumers as compared with previous years is based, however, on the illegitimate assumption that the elasticity of demand is actually zero.

of India seem often to be more carefully and intelligently watched by the Lancashire spinners than by the Indian importers. The result of this has sometimes been to give the curve of spinning profits an appearance of sustained "periodicity" for which neither the period of gestation nor the alternations of the Indian seasons would have sufficed alone to account. Thus the speculative prolongation of the Indian demand in 1889–90 enabled spinners to make large actual profits, while their own critical observation of the Indian rains prevented them for a time from annihilating those profits by over-investment.[1] Similarly in 1896 a good importers' demand was accompanied by a drastic reduction of spindles dictated by Indian weather conditions, with the result that profits remained almost stationary in 1896 and leapt up in the great famine year 1897. On the other hand the over-investment when it came in 1890 had been aggravated by the apparently rational inferences of spinners from the weather conditions of 1890,—inferences which were falsified owing to the previous irrationality of importers. Moreover, just as the successive impacts of different streams of demand were seen to produce a continuous boom in shipping, so an increased Continental demand [2] for yarns or piece-goods or both seems sometimes (e.g., 1887, 1889, 1895) to dovetail into the interstices of Indian inquiry and so to prolong the boom. The net result of all these forces is that while between 1886 and 1908 there were at least *six* serious failures of the Indian crops separated by periods of plenty, there were only *three* complete upward and downward sweeps of the curve of spinning profits.

[1] N.B., the marked check to the growth in the number of spindles in 1890.

[2] The Continental demand, while mainly a reflex from constructional industry, is also partly dependent on a transfer of resources to agricultural consumers (cf. especially Messrs. Ellison's Continental reports in circulars of 1910–1 and 1911–2).

§ 3. CROP-CONSUMERS AND CONSUMPTIVE INDUSTRY—GREAT BRITAIN AND UNITED STATES.

The other group of consumers of food grains in whose hands an increase of available resources materially raises the demand for the products of English consumptive industry is the English working-classes. And since there is abundant reason to believe that their demand for wheat is on the whole inelastic, here again it is a low price of grain that is correlated with an increased prosperity of the consumptive trades.

In particular this factor seems to be of the first importance in determining some of the most characteristic movements of the English clothing trades. For while the cotton trade is mainly dependent on the Indian grain-consumer, and certain branches of the woollen industry are much affected directly and indirectly by the fortunes of American agriculturalists and other foreign customers, the course of our woollen and clothing trades on the whole is very much more dependent on the movements of home demand.[1]

[1] According to Sir Charles Macara (letter quoted in *Ec.*, 1909, p. 1323), three-quarters of the product of our cotton spinners is exported in some form or other: other estimates put the proportion as high as $\frac{4}{5}$ (*Ec.*, 1910, p. 797), or even $\frac{5}{6}$. I know of no similar expert estimate for the wool industry, but the following figures are significant. Those for output are from Table I (*a*) (goods made by firms for sale, including work done for them on commission) of the Preliminary Tables of the Census of Production (Cd. 4896, 1909), those for export from the *Stat. Abs. of U.K.*:—

	Yarn.		Piece-goods.		
	Cotton.	Wool.	Cotton.	Woollen.	Worsted.
Output	m. lbs.	m. lbs.	m. yds.	m. yds.	m. yds.
1908	1507·4	149	7030	173	181
Export					
1907	241·0	83	6298	85	99
1908	214·8	71	5531	76	74
Output	£	£	£	£	£
1908	79·3	18·1	81·9	16·4	15·6
Export					
1907	15·4	6·0	81·0	10·3	7·4
1908	12·8	4·6	70·2	9·6	5·9

Thus it was partly owing to the sharp rise in wheat prices in 1872–3 that the woollen trade failed to share in the general elation of trade in those years. But in 1874–6, when depression in the great constructional trades was accompanied by a rapidly falling level of wheat prices, the home branches of the woollen trade seem to have done on the whole very well.[1] In 1877, however, with a sharp rise in wheat prices, there was a severe falling off in prosperity. Again in 1880–1, when there was a marked reaction from the low wheat prices of 1879, it was the export and not the home demand that contributed to the prosperity of the trade.[2] But already in 1881 with the slight relapse in wheat prices, "there has been a continued improvement" in ready-made clothing at Leeds: in 1882–4, in spite of a continuous decline in exports, demand was good: and even in 1885, the classic year of trade depression, it seems that on the admission of the trade itself "a large volume of business was done." There can be no doubt that the immense fall in wheat prices in these years was a very

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In the case of piece-goods the figures for export bear a much higher proportion to those of production in the case of wool than in that of cotton. In the case of yarns this is not so: but it must be remembered that the census figures only take account of yarns *sold* by one firm to another, so that in view of the much larger proportion of combined spinning and weaving establishments in the wool (that is, in the woollen branch: in the worsted branch specialisation is the rule: cf. D. H. Weld, Specialisation in the woollen and worsted industry: *Quarterly Journal of Economics*, Nov., 1912, pp. 67 ff.) than in the cotton trade, the figures for output of yarns are not comparable.

[1] "It has not been profitable," said a shrewd man of Bradford in 1874, "but we have made money." "The producing power of this district," we learn from Huddersfield, "largely increased as it has been of late years, has been kept fully employed from first to last in 1874. And this is the more remarkable in view of the great depression which has so widely prevailed in other leading industries." Again in 1875, Messrs. Helmuth Schwarze call attention in their circular to the "comparative prosperity of the clothing trade, especially in the commoner kinds of goods"; and the rise in the price of the raw material in the second half of 1876 was partly due to a marked recovery in consumptive demand.

[2] At Halifax, in 1880, "home buyers have been little in the market"; in 1881, according to the *Leeds Mercury*, "the chief increase has been in the shipping rather than the home trade."

considerable benefit to the industry, and that their continued low level in 1886–90 contributed materially to its prominence—especially the prominence of that important barometer the Leeds ready-made clothing trade—in the revival of those years.[1]

The explanation of the movements of the industry from 1891 to 1896 must be sought in the main elsewhere: but its collapse in 1897–8 must I think clearly be connected with the price of wheat. 1897, it must be remembered, was a year of rising cotton profits, and of increased production and price of both iron and coal. Obviously the divergence of wool in this year is crucial to our whole inquiry. Various explanations—the great engineering dispute, the warm weather—suggested themselves to contemporary observation: but it does not seem that either of these causes is sufficiently fundamental. Moreover, the depression continued in the following year, when neither of these causes can be invoked, when the prosperity of the three other great industries was even more marked, and when shipbuilding had been added to their number. It is, I think, clear that we must look for the solution in the world's wheat-shortage of 1897–8, culminating in Sir W. Crooks' wheat-scare and the Leiter corner, and finally relieved by the record crops of the season of 1898.

[1] For the recovery of 1886, cf. pp. 27 and 61. "There is little doubt, however," we are told, "that it was not the state of the wool market alone which caused the revival." Between 1885 and 1889 it is estimated that our export trade increased 10 per cent., but our home trade as much as 30 per cent.; moreover, there were evidences of a better quality in the goods supplied.

[2] The Gazette price of wheat, which had touched 22*s.* 10*d.* per quarter in 1894, rose from 26*s.* 2*d.* in 1896 to 30*s.* 2*d.* in 1897 and 34*s.* in 1898. The hypothesis that the effect of this rise on the purchasing power of the masses was of predominant importance to the woollen industry is borne out by the evidence as to the relative diminution of the demand for the different qualities of goods. Thus in 1897 we learn from Leeds that "generally speaking the home demand for the higher class of goods, such as the superior worsteds, has been large and steady, for the medium class only moderate and somewhat fluctuating, and for the lower qualities distinctly poor. . . . The trade in ready-made clothing has shared

The relapse of wheat prices in 1899 permitted the home trade to take its share in the boom of that year: but from 1900 to 1903 it was disappointing, and in the second half of that year took a decided turn for the worse, which was confirmed in 1904. All sorts of explanations may be invoked: in 1900 manufacturers blamed the growing habit of the people of spending their money on seaside excursions rather than on clothing, and in 1903 the bad weather, which made people think that "anything will do for such a climate." Yet in the fine weather of 1904 things went from bad to worse: people even showed a tendency to refrain from buying whole suits, and to "be content with odd garments simply."[1] It seems we must look for a more comprehensive explanation, and again the price of wheat furnishes some assistance. Even in 1899 it never nearly touched the pre-1897 level, and thereafter, save for checks in 1901 and 1906, it rose continuously till 1909. As a result wool took but little part in the feverish activity which marked the cotton and constructional trades in 1905–7.[2] Only in 1906 (in which year, it should be noted,

the depression." Similarly, in 1898, "the lower kinds of fabric have been the most difficult to sell." Nothing could show more clearly the unequal incidence of high food prices on the different classes of the community: nothing could show more clearly, in view of the general feeling of depression that prevailed in the woollen industry during these two years, that the predominant factor in its prosperity is neither the demand from abroad nor that of the speculative and investing classes at home, but the general consumptive power of the mass of the population.

[1] This account of 1904 is confirmed from the cotton trade, where "in the home trade buyers have held back owing to poor reports from retail distributors: at the present time there is no buying going on in home goods worth noticing."

[2] The revival in 1905 was mainly due to the export trade, which had already begun to improve in 1904: the home trade in general was far from brilliant,—in fact, says a Bradford report, "business in the large centres of population has been most unsatisfactory." The explanation of the comparative prosperity in 1905 of the Leeds ready-made clothing trade, which appears on this occasion to have been a less trustworthy barometer than usual, seems to me to be that after a considerable period of retrenchment, culminating in the pathetic state of affairs described in 1904, a moment comes when a further postponement of expenditure on clothing is impos-

there was a relapse of wheat prices) do we find anything that can be called enthusiastic accounts of the trade [1]: in 1907 the impression is one of satisfactory, but not, considering the state of other industries, very exhilarating activity. The comparative prosperity of 1908–9 indeed finds no justification in the course of wheat prices; but their fall in 1910 doubtless contributed to the boom of the trade in that year.[2]

The boot and shoe trade shows unmistakable traces of the same influence. Thus after two years of good trade, 1895–6, manufacturers of leather in 1897 "were not so happily situated as merchants, in spite of abundant supply and reduced competition," for they had only "a variable consumption of leather to depend on"; and 1898 was said to be less active than 1897. In 1899, however, trade was very good, in 1900 fairly good and "likely to improve," and in 1901–2 "fairly active," in spite of the handicap of foreign competition. In 1903 and 1904, however, it was bad, and at the end of 1905 we learn that "stocks of boots and shoes at the present time have accumulated, indicating clearly the poverty of the people generally." The trade of 1906 was "unquestionably disappointing," and that of 1907 only "fairly active," though with "an output quite up to the average." [3]

sible, whatever the state of one's finances. Hence the appearance of prosperity in the clothing trades in this year, an appearance which is confirmed by the rise in the profits of ten leading drapery companies from £363,000 in 1904 to £465,000 in 1905 (*Ec.*, 1906, p. 307), must not be too readily taken as evidence of a genuine increase in the purchasing power of the community. Compare Dr. Marshall's illustrations of the increased consumption of cotton, in spite of famine prices, in 1864, and of the comparatively early revival of the boot trade in the United States after the depression of the seventies.

[1] And in 1906 there were more failures in the drapery trade than in any of the four following years.

[2] The factors at work on the trade in the last three years are too complicated to permit the effect of the continued fall of wheat prices in 1911, the rise in 1912 and the fall in 1913, to be clearly seen: cf. especially p. 74. The home consumption of cotton has, however, been good throughout 1913 (*Ec.*, Ap. 18, 1914).

[3] A comparison of these comments with the export figures serves

The *per capita* consumption of food other than wheat is largely influenced by the same factor. Mr. G. H. Wood, indeed, who has reduced to order[1] the most important data for the years 1860–1896, bases on them the conclusion that the trend of consumption follows closely in an inverse manner that of the Board of Trade unemployment percentage, which again, as is well-known, is affected principally by the activity of the constructional trades.[2] It appears to me, however, that the relation is somewhat more complex

to show that in this industry, as in that of wool, the home consumption is of leading importance, and that its fluctuations afford very similar evidence as to the conditions of general consumptive power.

Number of dozen pairs exported.

1895	674,620	1904	675,669
1896	745,018	1905	774,061
1897	642,264	1906	783,974
1898	638,920	1907	786,858
1899	603,498	1908	784,197
1900	630,244	1909	839,980
1901	678,543	1910	1,086,868
1902	788,838	1911	1,152,600
1903	773,858	1912	1,393,096

It will be noted that exports show a minimum in the boom year 1899 and a large increase in the year of accumulating stocks, 1905. (The figures include footwear of caoutchouc up to 1900, and of "other materials" up to 1907, but this does not appear to affect their trend.) It would seem, however, that the demand for boots is still more urgent than that for clothing, whence the greater prosperity of the trade in 1900–2 and again in 1908 (cf. note 2, p. 113). This is not contradicted by the earlier revival of clothing in 1905–6, for the consumption of boots on a large scale having survived that of wool by some three years, the average state of decay of the boots being worn in 1905 would be less than that of the clothing, and so their renewal less urgent. In recent years the trade has been handicapped in taking advantage of good consumptive power by the high cost of material,—alleged to be exceptionally important in this case. "The greatest difficulty has been experienced in obtaining highest prices from the public, which has been accustomed for years to pay a fixed price for its boots" (*Ec. Hist.* of 1913). While low food prices may lead to a demand for more boots at existing prices, they will not apparently induce acquiescence in a higher level.

[1] *Stat. Jour.*, 1899, p. 639.

[2] Thus also Mr. Bowley, in commenting on Mr. Wood's paper, suggested that consumption "appeared to have moved with wages from 1860 to soon after 1870, but after that to have left wages and moved with employment."

than this. Mr. Wood's general index is not in all respects suitable for our present purpose[1]: I have therefore drawn a curve of the *per capita* consumption of six important articles of food (tea, sugar, meat, tobacco, currants and raisins, and coffee), using Mr. Wood's indices up till 1896, and indices[2] with the average consumption of 1896–1905 as base for 1896 onwards.[3]

Other aspects of these curves must be discussed later: in the present context it is sufficient to note that they are adversely affected by rising wheat prices in 1877, 1880, 1897, 1902–3, 1905, 1908 and 1913, and favourably by falling wheat prices in 1874–6, 1879, 1881–6, 1894, 1899, 1901 and 1911. It should be noted that while on some

[1] In the first place it includes figures of the consumption of raw cotton and wool, which are indices rather of manufacturing activity than of ultimate consumptive power; in the second place it includes certain kinds of alcoholic drink, the consumption of which seems to depend partly on rather peculiar psychological factors, and which it is therefore desirable to treat separately.

[2] The figures are from the *Statistical Abstracts*, except for meat, which are from the *Abstract of Labour Statistics*, and based on the *Report of the Dep. Com. on Combinations in the Meat Trade*, 1909. The meat figures are for years ending May 31, and I have been obliged to assume that half of the consumption indicated took place in each of the calendar years involved. I originally included also cocoa: but the great rise in consumption in 1897 and again in recent years seemed to introduce a disturbing element out of all proportion to the importance of the article.

[3] He takes as base the average consumption in 1870–79. I have not thought it worth while to translate one curve into terms of the other, as the object is to show not the trend over a long period, but the fluctuations between neighbouring years. I have attributed equal weight to the indices, since such a proceeding, though no doubt more perilous with such a small number as six commodities than with Mr. Wood's fourteen, does not seem likely to lead to serious error: in some cases, however, such as the currant shortage of 1900, we must be on our guard. Moreover, the figures are not so valuable for year to year comparisons as for showing the general trend over a number of years, owing to the existence of stocks and for other reasons. In particular, Major Craigie issues a warning against such a use of the meat figures, especially as between 1892 and 1893 (cf. *Stat. Jour.*, 1899, p. 672): nevertheless an appreciable diminution in 1893 is indicated by Mr. Hooker's figures as well as Mr. Wood's (*15th Abstract of Labour Statistics*, p. 50).

occasions food and clothing share the favours of the emancipated purchasing power, on others (notably in 1910 and 1911) they are rival suitors for its hand.

In America also there are evidences of the influence of cheap grain upon certain other kinds of food consumption. The curve of consumption of sugar shows a movement divergent[1] from that of the home production of the relevant season in the fiscal years 1887 to 1890, 1892, 1902, 1908–10. In all but three of these years the movement is the same as that of the coffee-curve, and needs therefore, no separate discussion[2]: but the curious increases in sugar consumption in 1887 and 1890 and the still more curious collapse in 1902 (after big home and foreign yields and in a year of apparently all-round prosperity), must, I think, be brought into relation with the variations in the price of maize[3] and of beef.[4] The consumption of sugar appears to be supple-

[1] Only years in which this occurs are relevant, since the estimates of "consumption" (*Stat. Abs. U.S.A.*, 1912, p. 504) are arrived at simply by adding net imports to home production. I omit the years 1894–6 and 1897–8 in which the form of the curve is clearly due in part at least to the Wilson and Dingley tariff revisions (the average *ad valorem* rate was 14 per cent. in 1893–4, 39·77 per cent. in 1894–5, 42·07 per cent. in 1896–7, 77·47 per cent. in 1897–8: *ibid.* p. 500).

[2] Cf. p. 104.

[3] Cf. the following figures (in cents per bushel):—

	Average Home Price.	Export Price.		Average Home Price.	Export Price.
1885 . .	54·0	51·0	1892 . .	55·0	54·0
1886 . .	49·8	52·2	1893 . .	53·0	49·9
1887 . .	47·9	48·7	1894 . .	46·0	50·9
1888 . .	55·0	59·2	1895 . .	53·0	47·7
1889 . .	47·4	43·7	1901 . .	46·0	56·7
1890 . .	41·8	48·1	1902 . .	68·0	68·4
1891 . .	57·4	70·4	1903 . .	54·0	57·2

The average home prices (till 1889 from Babson's *Business Barometers*, pp. 84–5, from 1890 New York prices, *Stat. Abs. U.S.A.*, 1912, p. 549) are for *calendar* years, and are sometimes (notably 1890) clearly influenced by the harvest of the current rather than the previous year. The export prices, though a less satisfactory index of cheapness to consumers, have the advantage for our present purpose of being calculated for fiscal years.

[4] There is a close connection between the price of the raw material maize and that of the finished product beef.

Cf. the following figures:—

mentary rather than rival to that of corn and meat.[1] There is in this country one more important kind of consumption,—that of house-room, which is largely affected by the level of wheat prices. But the connection between the price of wheat and the activity of the building trade is obscured by several circumstances. In the first place most of the indices available until quite recent years (cf. Chart XIII.) have been of building in general and not of house-building in particular. Thus the high prices of brick and timber and the active employment in carpentering in such years as 1874, 1899–1900, 1906 [2] and 1910–1 seem to have been due to the activity of other trades, notably ship-building and cotton,[3] as much as or more than to house-

Calendar Year.	Salt Beef.	Loins of Beef.
1885	95·7	111·1
1886	82·6	105·6
1887	60·9	100·0
1888	65·2	100·0
1889	60·9	111·1
1890	56·5	105·6
1891	60·9	105·6

(*Aldrich Report Index*, price of 1860 = 100.)

Calendar Year.	Beef extra mess in N.Y. market.
1900	$9·73 per barrel.
1901	$9·32 ,,
1902	$11·75 ,,
1903	$9·03 ,,

(*Stat. Abs. U.S.A.*, 1912, p. 549.)

	Beef, Salt.	Beef, Fresh Roast.
1893	100·3	99·0
1894	98·9	98·3
1895	99·6	98·6

(*Bulletin of Bureau of Labour* (1910) *Index*, average 1890–9 = 100.)

[1] If this surmise is correct, we may admit a genuine increase in sugar consumption in 1894, and again in 1903: cf. above figures. The assumption in the text that the home demand for beef is inelastic does not conflict with our hypothesis (chap. vi. § 1 *sub fin.*) that the world's demand is elastic. The figures of volume and value of the corn crop for 1887–8–9, 1894–5–6, 1901–2 (cf. Chart VI.) suggest that in so far as it is put upon the market the demand for it may very probably be inelastic.

[2] The price of brick, however, fell in 1906 (owing partly to the competition of structural steel), and there were numerous failures in the timber trade, which declined from September.

[3] An important client to the timber trade: cf. *Economist*, 1909, i. 110. Thus also Mr. Dearle (*op. cit.*, p. 25) attributes the greater prosperity of the trade in the north than in the south of England in recent years to the cotton and iron booms.

building.[1] But secondly, even the movements of the house-building trade do not always follow closely upon the movements of general purchasing power. For, first, the hire, or still more the purchase for occupation, of a new or better house represents a discontinuous advance of expenditure not likely to be undertaken until there has been some accumulation or at least some repetition of the increased purchasing power.[2] Secondly, building represents the provision of the instrument of production, not of the finished service, and its activity is not therefore always a good gauge of the strength of consumptive demand: on the one hand it may be speculatively prolonged, on the other the first wave of emancipated purchasing power will spend itself in the filling of houses already existing but unoccupied. The net result is that while house-building shows, for instance in 1874–6 and 1904–9, unmistakable traces of the influence of wheat prices, its activity is sometimes, as in 1877 and 1897–8, carried past the rise which is

[1] This assertion is confirmed by Table VI. The figures (published quarterly in the *Labour Gazette* from returns made by local authorities of the estimated cost of the several kinds of buildings for which they passed plans in each quarter year) suffer somewhat from not being continuously comparable, owing to variations in the number of authorities reporting, and from being estimates of value and not volume of consumption: but one conclusion is clear. While the figures for factories, etc., show a rise over the corresponding quarter of the preceding year in ten cases out of eleven, those for total building show a rise in six cases, and those for dwelling houses only twice. The rise in the first quarter of 1911 is scarcely significant, and it is only in the latter part of 1912 that housebuilding can be said to have begun to come into its own. The variations between successive quarters are probably determined in part by seasonal variations in the rates for money, and in the weather conditions for starting work; whence the tendency to fall in the *third* quarter.

[2] There seems some reason to suspect a trans-cyclical change in this respect since about 1870: in the fifties and sixties the building trades, especially through the channel of the working-class building societies, were more successful in reaping the firstfruits of expanding consumptive power than they have since been. The Land Committee, however (II. 9, i. ff.), deny the existence of any signs of permanent decline in the desire to own one's own house.

fatal to other kinds of consumption ; and it is often late, as in 1887, 1896 and 1912, in profiting by the fall.[1]

It only remains to observe that, as might be expected from the above analysis, the *furnishing* trades show a rather closer affinity with the other kinds of consumptive industry. Thus in 1894, 1899, 1910–1[2] they seem to have benefited sooner[3] than the building trade by the movement of wheat prices, while on the other hand in 1897 they were hit more quickly.[4]

[1] A slight check to the decline in activity in 1902 may also be referred to the fall of wheat prices in 1901.

[2] And perhaps (to judge from imports but not from employment) in 1883–5 and 1901.

[3] It is interesting to contrast America, where, building being more largely anticipatory and speculative, the curve of furniture prices is apt to start its pronounced rise one year later than that of building material prices, e.g., 1899, 1906, 1910.

[4] Similarly in America, the furniture index shows clearer traces than that of building materials of the check to immigration in 1893, 1901 and 1904 (though not in 1889, nor in 1911 ; but n.b., the earlier falling off in employment in 1910 (Table IX.) and the good consumptive conditions of 1911 (p. 177, n.).

PART II.

Fluctuations of General Trade.

CHAPTER I.

The Revival.

§ 1. FALSE METHODS OF APPROACH.

In the preceding discussion we have been frequently met by indications that the alleged universality and simultaneity of the so-called general fluctuations of trade are in part a figment of the public imagination,—that the vicissitudes of the several industries and groups of industries are in no small measure governed by their own individual idiosyncrasies of supply and demand. Nevertheless, we are apparently not in a position to deny the existence of something which may fairly be called an alternation of general expansion and depression, and of which we have not as yet succeeded in giving a comprehensive explanation. That is the task of the present book.

The task is no light one, but it can be simplified to some extent by certain expedients. First it will be convenient to neglect for the present such essential modifications of the course of events as arise from the existence in modern industry of a monetary mechanism and a system of wage-labour. Secondly, it will be desirable to follow the practice of most writers in breaking at some point arbitrarily into the magic circle of industrial change, and to consider first the birth of "expansion," and pass on afterwards to the "crisis" or turning-point and thence to the "depression" of trade. Thirdly, it will be desirable at various points to

clear the ground for further advance by the demolition of certain popular but misleading arguments which encumber the path of true analysis.

Let us begin then by attempting to account for the genesis of an expansion of general trade. And here at the outset we are met by the necessity for a preliminary consideration of the explanation which in one form or another does duty in the majority of writings upon this subject. An expansion, according to this theory, beginning in some one or more of the consumptive trades, is communicated by the increased demand for instruments to constructional industry; and is thence spread, by means of the demands of those engaged in constructional industry, among the other trades making for consumption. An objection to the first limb of this theory is sometimes based on the admitted fact that the fluctuations of constructional industry are disproportionately large compared with those fluctuations of consumptive industry of which they are alleged to be the effect. This objection, however, appears itself to be open to a threefold answer.

In the first place it is clear that in some industries the magnitude of the changes in consumers' demand is apt to be under-estimated. This is particularly true of those "public utility services" alluded to at the beginning of Part I. ch. ii. § 1.[1] In such industries new investment, though clearly justified by consumptive demand, is not heralded by a rise in price, because, the service in question being strictly localized, it is *ex hypothesi* entirely non-existent before the new investment takes place,[2] and the only evidence of the demand for it is the general economic condition of the community in question.

Secondly, M. Aftalion points out[3] that a small pro-

[1] This fact is alluded to by M. Aftalion (*Journal d'Economie Politique* 1909, pp. 215 ff.), though he does not note the explanation.

[2] There is of course an important exception in the case of the doubling of the track in response to an increased volume of traffic over a particular route: though even here the demand factor is apt to be under-estimated, owing to the relative fixity of railway charges caused by legal restrictions.

[3] *Ibid.*, p. 219.

portionate change in the demand for consumption goods may produce a large proportionate change in the demand for construction goods: for instance, supposing 10 per cent. of the annual output of boots is produced by new machines, a rise of 10 per cent. in the demand for boots will produce a rise of 100 per cent. in the demand for new machines.[1] Somewhat similarly Professor Carver suggests [2] that when working expenses are relatively very large, a small percentage addition to the value of the product will make a large percentage addition to the value of the fixed plant, and therefore to the demand for new construction materials. This consideration indeed is *ex hypothesi* most important in those industries in which fixed capital is relatively small,[3] i.e., probably in those whose demands are of the smallest absolute significance to constructional industry. Before, however, refusing to admit its importance, we must remember that the actual demand for instrumental goods is by no means the same as the warrantable demand, least of all in industries where the fixed capital is large: hence in such industries an increase in consumers' demand may still be the initial though by no means the sole cause of a larger proportionate increase in the demand for instrumental goods.

Thirdly, even if the effect upon constructional industry of variations in the prosperity of any single consumptive

[1] It is not, however, clear that a fairly steady policy of renewals on this scale always implies that existing plant is working at maximum capacity, and will not be able to supply some at least of the new product demanded.

[2] *Quarterly Journal of Economics*, 1903–4, p. 497.

[3] It is true that if, as is likely, the fixed capital is not only large but indivisible and intractable (cf. Part I. chap. ii. § 1), the contribution made in time of depression to general costs is likely to be small, and a given increase in total receipts to make therefore a large proportionate addition to the value of plant: but the importance of this consideration is minimised when we reflect that its operation is likely to be most marked when the demand for the product is inelastic, in which case a given elevation of demand is likely to produce a comparatively small increase in total receipts; and that in any case the effect will only be the emergence of something more like the anticipated return on invested capital, which will not constitute a rational incentive to further investment.

trade be relatively small, it is often urged that the need for construction goods being fundamental to *all* and not merely to one consumptive industry, the variability of the demand for them is naturally likely to be greater than that of the demand for any class of consumptive goods.[1] This proposition indeed as it stands does not seem to be self-evident. On the contrary, if there is no reason to suppose that the variations in the several consumptive industries are interdependent, it ought clearly to be probable that the variability of constructional industry as a whole will be less than if it was dependent on any single client ;[2] and it ought not to be improbable that the excess of the variability of that part of it which is devoted to satisfying any one client over the variability of the whole will be greater than the excess, if excess there be, of the variability of that part which is devoted to satisfying one client over the variability of that client ; so that the variability of constructional industry as a whole might well be expected to be less than that of any single consumptive industry.

It follows that this explanation of the large variability of constructional industry would seem to be invalid, unless we have reason to suppose a considerable measure of positive correlation between the variability of the several con-

[1] Thus M. Lescure, while in the main finding the origin of fluctuation in the instrumental trades, appears to recognise a subsequent and supplementary cause of the prosperity of constructional industry in the demand for materials by the consumptive trades, a reaction the magnitude of which he explains in the following words : " Dans une société capitaliste progressive, il existe en effet une branche de production particulièrement mise à contribution, c'est l'industrie des moyens de production. Les commandes de toutes les industries se concentrent dans ses usines " (*op. cit.*, p. 503).

[2] This thesis is a particular application of the general proposition, of vital importance throughout economic science, that " the precision of an average is proportional to the square root of the number of terms which it contains " : cf. Pigou, *Wealth and Welfare*, p. 141. But the Professor, after pointing out the relative stability of raw material industries, with a large number of outlets for their product, as compared with the finishing industries with specialised markets, concludes rather curiously (p. 143) by lumping together iron and coal with sugar as industries which might be expected to have a high variability.

sumptive industries. Though, however, it has appeared in the preceding part that the amount of positive correlation is considerably less than is often supposed, the probability of such correlation (whether due to community of agricultural markets or of financial environment or what not) cannot, so long as we follow the ordinary lines of popular arguments, be denied. The first limb of the theory under discussion appears therefore to survive unscathed the prima facie objection based on the relative largeness of the fluctuations of constructional industry.

Both limbs of the theory are, however, open to a more fundamental criticism. Does not the whole notion of the communication of prosperity from one industry to another in an endless chain imply an elementary confusion of thought? Is not the prosperity of the original group of consumptive trades accompanied by a rise in the exchange value of their products, involving a fall in the exchange value of the products of other trades which cancels the effect upon constructional industry? Again, does not the subsequent alleged "repercussion" from constructional industries upon the other consumptive trades merely mean that those trades which minister to the special needs of constructional industry are enabled in the long run to benefit at the expense of those of which the fall in the value of the products originally upset the equilibrium? The whole theory of repercussion, as expounded so glibly for instance by M. Lescure, appears to be engaged in making something out of nothing, and to rest upon a quicksand. We are forced therefore to penetrate somewhat deeper in our attempt to analyse the nature of a revival of general trade.

§ 2. THE GROWTH OF PRODUCTIVITY.

The best method of analysis seems to be as follows. An increased prosperity, in the sense of an increased volume of consumption, in any producing group can only, in the absence of miscalculation, result from a rise in the productivity, in terms of satisfaction, of the effort expended by that group. Such a rise may come about in three ways,

—by a rise in the productivity of their effort in terms of the goods which they themselves produce, by a rise in the exchange value of their product, or by a rise in the satisfaction afforded them by the goods for which they exchange their products. We have to consider these three possibilities when the producing group concerned consists of industry as a whole.

The first kind of rise may clearly occur simultaneously in the totality of trades through a general lowering of the real costs of production. It must be clearly understood that we have to deal here not with such a lowering of the cost of materials, labour, etc., as involves a mere transference of wealth from one group of producers to another, but with a real lowering of general costs in the sense of an improved organisation and equipment of man in his fight against natural obstacles. Now assuming a condition of "depression" it is pretty clear that there are forces at work tending to such a general reduction of real cost. Thus M. Tugan-Baranowsky[1] gives a number of citations to show that the great technical improvements in the cotton industry have been made during times of depression. Similarly M. Aftalion[2] contends that during a depression "nombre de remaniements s'opèrent dans l'organisation générale de la production, dans le choix des matières premières, dans l'utilisation des sous-produits, dans la division du travail entre ouvriers, dans la spécialisation même des établissements. Une guerre plus vigoureuse est faite au gaspillage, au coulage, aux frais inutiles."[3] Thus also Dr. Marshall points out that the average competence

[1] *Op. cit.*, p. 312. [2] *Op. cit.*, vol. ii. p. 228.

[3] So also Mr. Burton notes that production does not decrease in an equal ratio with employment, because of the introduction of improved methods under the stress of hard times (*Crises and Depressions*, p. 138): and M. Lescure insists (*op. cit.*, pp. 422–3) that the "crise de production et de consommation" is the signal for a "thorough revision of the costs of production," which includes among other things an extended use of the devices of concentration and integration; and attributes the prolongation of the American boom beyond 1900 to the unwonted adoption of this policy in times of rising prices. Cf. also Mitchell, *Business Cycles*, pp. 563–4.

of business men is likely to be greater in times of depression.[1]

There can be no doubt that industry possesses a considerable automatic recuperative power of this kind: moreover, it should be carefully noted that an increased prosperity arising from this cause in any single group of trades is not necessarily secured at the expense of any other group, and so may legitimately, if the field over which it extends be sufficiently wide, be regarded as an explanation of a constructional and a *general* revival. In particular the English booms culminating in 1890 and 1900 seem to have been in no small measure due to such an automatic recovery of general home industry. "There is evidence," says the *Economist* in its review of 1889, "that our home trade developed more rapidly than did our trade with foreign countries. . . . Our exports of cotton goods last year were about 2½ per cent. less than in 1888, but our consumption of cotton in the production of manufactures and yarns was full 16½ million lbs. greater. Our exports of pig-iron increased by 163,000 tons and our home consumption by 857,000, and by our home market also a large proportion of our increased production of woollen goods was absorbed." Similarly in 1890, "the trifling curtailment of our foreign trade has been much more than counterbalanced by an expansion of home trade."[2]

[1] "Those who have control of our loan fund are much more careful about their loans when prices are falling, and . . . are saved from lending to people who had the capacity for riding upon the surface of the rising tide, but who had not the capacity for contending against the stream." (Evidence before G. and S. Commission, C 5512–1, 1888, Q 9816.)

[2] Cf. also the evidence of a rapid growth of productivity furnished by the moderate course of non-constructional prices :—

B. of T. Index.	Raw Textiles.	Food and Drink.	Miscellaneous.
1888 . .	70·0	81·8	71·0
1889 . .	72·4	81·1	74·3
1890 . .	72·9	80·6	72·9

and by the progress of the gross receipts of railway goods traffic :—

	£ m.	Percentage rise on previous year.
1885	36·8	
1886	36·4	− 1·1
1887	37·3	+ 2·5
1888	38·7	+ 3·8
1889	41·1	+ 6·2
1890	42·2	+ 2·7

Again in the next period already at the end of 1894 "there were signs of improvement" in the ready-made clothing trade "and happily the forecast then made was realised by the time the New Year was not more than a few weeks old."[1] In 1896 "manufacturers in the Longwood and Slaithwaite districts, who are chiefly engaged in the manufacture of goods for the home clothing trade, have been very busy throughout the year"; and "merchants in the home trade record a year of increased properity." "One of the most notable features of the iron trade of 1897," says the report of the British Iron Trade Association, "has been that an increase of considerable amount in the output of finished iron and steel—altogether 376,718 tons, fell concurrently with a diminution in the construction of shipping tonnage to the extent of 207,000 tons. This decline was to some extent compensated for by the increased exports for the year, amounting to 140,667 tons, but this advance is so far from explaining the difference that it must be assumed there was a much greater home consumption, all the more so that the increased exports were mainly pig-iron."[2] Similarly in 1899 there is evidence that the advance in the price of pig-iron was gradual, and due to the demand of a number of small home industries.[3] Nevertheless, in view of our enforced opposition to the claim of variations in cost in the ordinary sense to furnish a complete explana-

[1] In the cotton trade also in 1895 the "home trade houses were understood to have had a not unsatisfactory year," and goods retained for home consumption rose from 249,653 to 271,900 bales.

[2] The advance of general home industry in this year is all the more significant in view of the obstacle presented by high wheat prices to a rise in consumers' demand. In 1894–6 the two factors had worked in co-operation.

[3] So also the improvement in pig-iron employment in the latter part of 1909, though due partly to the American spurt, was also due partly, as was the gradual improvement in iron and steel and engineering more largely to the gradual growth of demand from a number of miscellaneous home industries. The increased consumption of food, during the continuance of more or less pronounced constructional depression, in England in 1878, 1887, 1894, 1904 and 1909, in America in (fiscal years) 1895, 1897 (but cf. note 3, p. 104), 1905, 1909 may be adduced as additional evidence of the automatic recovery of industry.

tion of the revivals of particular industries, we may well be on our guard against allowing such reductions of real miscellaneous costs the sole or even the predominant place in determining the revivals of industry as a whole.

§ 3. HARVESTS. THE ELASTICITY OF DEMAND.

We are led on therefore to consider, with reference to industry as a whole, the second possible cause of increased prosperity in any group—a rise in the exchange value of its products. It should hardly be necessary to insist that a simultaneous rise in the exchange value against one another of the products of all trades is a vacant and meaningless phrase. But a rise, due to an increased bounty of nature, in the exchange value of the products of *industry* as a whole against the products of *agriculture* is clearly by no means open to the same objection.[1] There is, however, a widespread reluctance among modern writers [2] to admit its importance as a cause of general revival. This reluctance seems to be founded partly upon certain irrational habits of mind, and partly upon more coherent, if not conclusive, argument. Under the former head we may class, first, a tendency to infer that if the particular theory of periodicity connected with the name of Professor W. S. Jevons is proved invalid, the whole theory of crop influences breaks down together with it: [3] secondly, the assumption that a lack of positive correlation between agricultural and other prices disproves the existence of any causal connection: [4] and

[1] This phenomenon might indeed be classified as a reduction in real costs in one important branch of "industry"; but the treatment adopted seems to be on the whole more convenient.

[2] Mr. Hawtrey is among the most dogmatic; cf. *Good and Bad Trade*, p. 87. "Except in the special instance of an actual famine, the fluctuations of demand or supply [of corn] produce no fluctuations in trade as a whole."

[3] Cf. in particular Tugan-Baranowsky, *op. cit.*, p. 239.

[4] Cf. *ibid.*, p. 237. "La comparaison du prix de pain avec les phases du cycle industriel montre avec évidence complète qu'il

thirdly (as in the somewhat analogous case of the "quantity theory" of money), an excusable resentment that the advocates of the crop theory have not been at sufficient pains to explain in detail the *method* of its operation.[1] These nebulous objections need scarcely detain us; but the two more definite arguments deserve more careful consideration. The first asserts that the effect upon general industry of the contemplated change in the ratio of exchange would in any case be nil: the second asserts that supposing the possibility of such an effect, the actual changes in the ratio of exchange under modern conditions are so small as to make that effect negligible.

The first argument[2] may be briefly expressed thus. Suppose there is an abnormally large wheat crop: the elasticity of demand for wheat is either one or greater than one or less than one. In the first case the distribution of purchasing-power will remain unchanged: in the second case there will be a transference of purchasing-power from consumers to the producers of wheat, and in the third case from the producers to the consumers. But in any case what is lost by one party is gained by the other, and there is no change in the aggregate volume of purchasing-power which forms the source of demand for the products of other industries; there is no reason, therefore, why an increased output of wheat should lead to any increase of activity in industry as a whole.

One cannot be surprised that this objection should be made when one reads such a passage as the following. In

ne saurait être question dé dependence causale entre ces deux ordres de phénomènes." Still more oddly Aftalion, having remarked that high food prices are sometimes correlated with industrial collapse, naïvely concludes: "Manifestement, l'agriculture ne joue qu'un rôle de second ordre en notre sujet" (*op. cit.*, Vol. I. p. 25).

[1] Thus Professor E. D. Jones (*Economic Crises*, p. 150) complains that Jevons seems unable to make up his mind whether it is large crops, by encouraging unrestrained speculation, or small crops, by producing a dearth, that precipitate a crisis. "The harvest theory appears to be holding to both horns of the dilemma."

[2] Of which neither Mr. Hobson nor Mr. Hull has been innocent.

the event of a deficient crop, says Mr. Burton,[1] "the consumer must devote a larger percentage of his expenditure to the purchase of necessaries, and will have a smaller percentage remaining for conveniences and luxuries, the demand for which is accordingly lessened. On the other hand the farmer receives no more for his products, for what he gains by increased price is offset by the decrease of the quantity which he has for sale." Mr. Burton is indeed trying to make the worst of both worlds.

The difficulty arises, in my opinion, from a failure on the part of opponents of the crop theory to realise that the resources which the consumers of corn[2] are prepared to expend on commodities in general (including corn) are not a fixed fund but a flow: and from a failure on the part of its advocates to realise that a mere alteration in the ratio of exchange will not increase that flow unless it involves an increase in the productivity of effort of corn-consumers *in terms of satisfaction*, in other words unless the elasticity of their demand for corn in terms of effort is greater than unity. If, however, this is shown to be the case, it does inevitably follow that the increased effort devoted to the acquisition of corn is not all of it withdrawn from the acquisition of other things, but is in part a net addition to the volume of effort expended: in other words, not only is the industrialists' consumption of corn increased, but so is their own aggregate production, so that their consumption of industrial products is not diminished by the whole amount by which the agriculturalists' consumption of those products is increased.

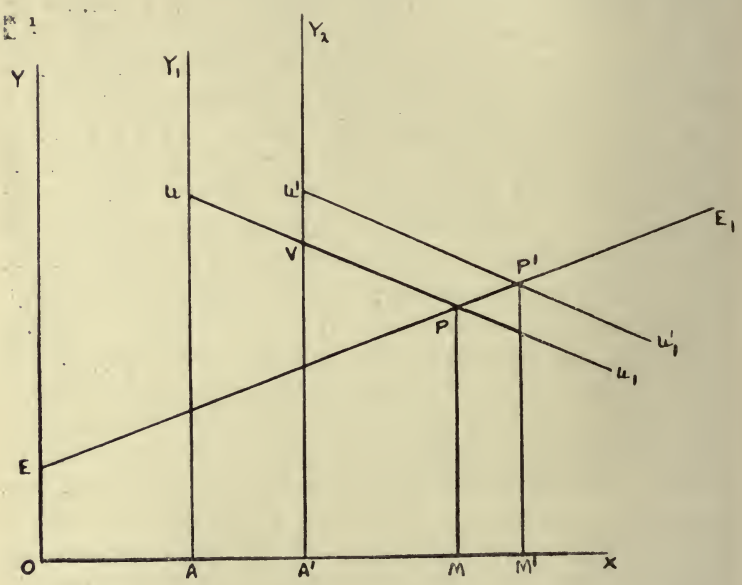
Conversely, if the elasticity of effort-demand for corn is less than unity, there will be a decrease in aggregate industrial production, accompanied indeed by an increase in mutual industrial consumption.

The following supplementary propositions will commend themselves on reflection, but will be rendered much clearer

[1] *Crises and Depressions*, p. 76.

[2] For the sake of brevity this word is used throughout this discussion in its Ricardian sense of any agricultural product.

by a reference to the annexed diagram.[1] The change in aggregate industrial production will be greater (i.) the greater the change in the amount of effort devoted to acquiring corn, (ii.) the faster the rate of change of the marginal utility of commodities other than corn, (iii.) the slower the rate of change of the marginal disutility of effort. The last two factors make also for a *small* change in mutual industrial consumption.



Units of effort are measured along OX, units of utility along OY.

UU_1 = curve of marginal productivity of effort in terms of satisfaction *derived from non-corn commodities.*

EE_1 = curve of marginal disutility of effort.

OA = units of effort expended upon corn.

If the effort demand for corn is elastic, A is moved to the right to A′, the starting point of UU_1 is moved from the ordinate Y_1A to the ordinate Y_2A', the point of intersection of the curves is moved from P to P′, and the aggregate of effort expended is increased from OM to OM′. If the effort-demand is inelastic A′ is moved to A, and OM′ reduced to OM.

MM′ will be greater (i.) the greater is AA′, (ii.) the steeper is UU_1 (since it is the interval UU′ not U′V that is given), (iii.) the flatter is EE_1. The last two factors also make for the smallness of (AM-A′M′).

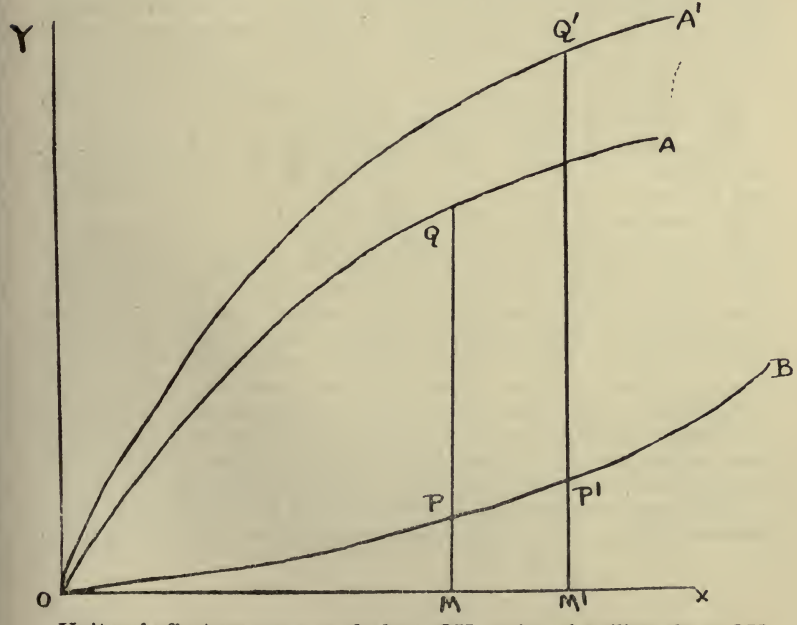
In estimating the effect of an increased production and lowered exchange-value of corn, it is important therefore to inquire (1) whether the elasticity of effort-demand for corn is likely to be greater or less than unity, (2) whether the factors determining the amount of the alteration in the aggregate of effort expended are likely to operate in the same way when the effort-demand is greater as when it is less than unity.

1. This depends upon—

(i.) The rate of increase of the marginal disutility of effort. At a time of slack trade this is likely to be slow.

(ii.) The rate of diminution of the marginal utility of corn to the consumer. While with certain products and certain bodies of consumers (for instance, with the majority of Englishmen in respect of wheat) this rate is rapid, there is reason to believe that with most products and taking the world's consumers as a whole it is pretty slow. The general conclusion is that the industrial demand for corn is on the whole greater than unity.[1]

[1]



Units of effort are measured along OX, units of utility along OY

2. (i.) As regards the first factor, the same considerations which make it probable that effort-demand will be elastic also make it probable that the inelasticity of an inelastic effort-demand will be less pronounced than the elasticity of an elastic one. Moreover there is a further point: it so happens that two of the most important cases in which there is reason to suspect an inelasticity of effort-demand—the United States maize crop and the Indian rice-crop—are cases in which the rate of diminution of the marginal utility of the crop to the *producer* is slow,[1] and the alteration therefore in the ratio of exchange due to a given crop-increase *comparatively* small. In such cases the restrictive effect upon general production of the inelasticity of effort-demand is *pro tanto* mitigated.

(ii.) There seems to me to be a general presumption that the rate of diminution of the marginal utility of general commodities will be greater when the effort-demand for corn is elastic than when it is inelastic, for the following reason. The current assumption of economists that a utility schedule which is elastic in one direction from the existing equilibrium-point is also elastic in the other seems to me to be true only under extremely "non-frictional"

OA = curve of total utility derived from expending effort on corn.
OB = curve of total disutility of effort.
OM = units of effort expended, the position of M being such that PQ is a maximum. Then the slighter the concavity of OA and the convexity of OB to the axis of X, the more likely is M^1 to lie to the right of M when OA is raised to OA^1.

It must be observed that the accuracy of this generalisation cannot be disproved in any particular case by demonstrating that the money receipts of producers have been smaller for a large crop than a small. The very increase of production instigated by the large crop may, if the supply of currency has not kept pace, have involved such a fall of non-agricultural prices that the smaller money receipts indicate a larger volume of commodity receipts.

Professor Lehfeldt, however (*Ec. Jour.*, June 1914, p. 217), estimates that during the last twenty-five years the elasticity of the world's demand for wheat has never exceeded 0·75. I am not competent to appraise the methods by which he reaches this result.

[1] The producers are also consumers on a large scale; cf. Piatt Andrew in *Q. J. of Ec.*, Vol. XX. p. 323, and *R. of I. T.*, 1908–9, pp. 4–5.

conditions, and to neglect an important psychological fact. Almost everybody is firmly convinced that while he could very easily do with a great deal more money than he has got he could only with great difficulty do with any less; for since most people's tastes and habits are based more or less consciously on those of the people slightly above them in the income-scale, they can be altered much more easily to suit a rise than to suit a fall in spending-power. From this fact—the importance of which I think has never been sufficiently recognized [1]—it follows that those whose effort-demand for corn is elastic and who are therefore compelled to reduce the effort devoted to securing other things, will not reduce it much: while those whose effort-demand for corn is inelastic and who are therefore enabled to increase the effort devoted to securing other things, are likely to increase it a good deal. Moreover, since there is reason to think that those whose effort-demand for corn is elastic are as a class poorer than those whose effort-demand is inelastic, the disinclination to reduce expenditure on other things is likely to be especially great in their case.

(iii.) There seems *primâ facie* ground for supposing that the comparative poverty of those groups whose effort-demand is elastic is due in part at least to an exceptional restriction of their business activity, and that the rate of change of the marginal disutility of effort will therefore be slower with them than with those whose effort-demand is inelastic.

The general conclusion then is that the aggregate volume of effort expended, in other words of production, is likely to be greater if the effort-demand for corn is elastic than if it is inelastic; that there is reason to think that on the whole it is elastic; and that the increase in general pro-

[1] Since a first writing of the above, I find current conceptions about the utility of income challenged by Professor Chapman in the *Economic Journal*, March, 1913, pp. 36 ff.; but whereas he argues that certain people live at times on what he calls a "western slope," I am only claiming that they live on an "eastern slope" with a steep hill on one side of them and a gentle decline on the other.

duction accompanying a given increase in the commodity-receipts of corn-producers is likely to be greater than the diminution in general production accompanying an equivalent decrease. For instance, supposing the commodity-receipts of producers are increased exactly as much by Hemichoros α of consumers as they are diminished by Hemichoros β, there is reason to suppose a net increase of general production, and also a net increase in the mutual consumption by the industrial population of each other's products. It only remains to inquire whether this conclusion is modified in any way by the consideration that the volume of resources *produced* is not necessarily the same as that utilized in exchange and consumption.

Now in the first place the alteration in the ratio of exchange is likely to affect not only the expenditure of individual effort but the utilization of accumulated industrial stocks. Now in a time of slack trade, the rate of change of the marginal utility of stocks is likely to be slow, and consequently the elasticity of commodity-demand for corn and the increase in aggregate expenditure to be large: [1] while on the other hand, if the elasticity of commodity-demand for corn should by any chance be small, it will argue a rapid rate of change in the marginal utility of stocks, and consequently a smallness in the diminution of aggregate expenditure.

Secondly, while the arguments which led us to believe that a given volume of resources will have a greater effect upon *constructional* industry in the hands of corn-producers than of corn-consumers, apply with less cogency to the effect upon industry in general, there seems some reason to suppose that, except in certain cases where the agricultural population is unusually devoid of economic freedom and dominated by custom in its habits of expenditure, resources will on the

[1] It is indeed true that the actual owners of stocks being as a rule comparatively wealthy, their demand for corn *for their own consumption* is likely to be inelastic; but since the corn is transferable to those whom they employ, this consideration is irrelevant. Contrast the conclusions of chap. iii. § 1 with regard to transport and constructional goods.

whole be less likely to be hoarded when concentrated in the hands of corn-producers than when scattered in the pockets of corn-consumers.

The general conclusion is therefore confirmed, that in certain circumstances the total volume of industrial activity may be diminished by an increase in the volume of crops, but that it is not likely in any case to be diminished much, and is more likely on the whole to be increased.[1]

[1] Professor Pigou indeed (*Wealth and Welfare*, Part IV. chap. v.) reaches by a more direct route the commonsense conclusion that an increase in the volume of crops is likely to increase the volume of general business; but I cannot regard his argument as altogether valid. Approaching the problem from the point of view of the real income of the working-classes, he asserts that an increase in the inflowing stream of natural resources will (in the absence of any reason to suppose an alteration in the proportion of resources devoted respectively to storage, consumption by the legal capitalist owners and the "purchase of labour") increase the commodity-income of the working-classes. Now it is perfectly true that it increases their consumption of corn; but the further inference that it increases their aggregate production and consumption of commodities in general rests on the assumption, tacitly made by Professor Pigou, that the elasticity of their labour-demand for corn is greater than one—in other words that the offer of an increased income of corn will in fact elicit from them a greater aggregate of effort.

In a correspondence with the present author, Professor Pigou explains that his analysis is intended to refer to a "homogeneous" society, from which the phenomena of exchange and the specialisation of productive function are absent. The former phenomenon, he says, may affect the direction, while it does not affect the volume, of the increased "investment in labour"; while the hindrances to mobility imposed by the latter may make the increase less than it would otherwise have been. But the initial effect is "prior to and independent of" these secondary phenomena.

I cannot regard the argument as convincing. Professor Pigou's use of the phrase "the purchase of labour" indicates quite clearly to my mind that in his published discussion he is, half unconsciously, taking into account the most fundamental aspect of the phenomenon of exchange. But as soon as this phenomenon is recognised, the comparative elasticities of demand for the things exchanged become obviously a matter not of secondary but of prime importance in considering the effects upon production and consumption.

The extreme importance of this conclusion both to this and to other parts of the theory of fluctuations, and the reluctance with which one differs from such an authority as Professor Pigou upon a point of analysis, must be the justification for the length and obscurity of this note.

§ 4. HARVESTS. THE LAW OF COMPENSATION.

We have still, however, to meet the second argument addressed against the notion of the dependence of industry in general on crop conditions—the argument which is founded on the relative smallness of agricultural fluctuations as compared with those industrial changes which they are invoked to explain. It may be noted indeed that in certain forms [1] this argument seems to be something of an *ignoratio elenchi*. The whole art of mechanical engineering is a study of how, by the economy of force, to produce great changes of position out of small. A small change in the position of the piston is able, by means of a system of wheels and cranks, to effect a large change in the position of the locomotive. To say that because changes in the volume of crops are small compared to changes in the volume of industry there is therefore no causal connection between them, is like saying that because the force necessary to wind up a motor-car is small compared to the subsequent activity displayed by the car, there is in this case also no relation of cause and effect. Nevertheless it is clear that if the magnitude of agricultural fluctuations can be shown to be absolutely so small as to be practically negligible, we shall be wrong in attributing to them any important influence on the volume of industrial activity. Now it is urged with much plausibility that in earlier times the importance of variations in harvests may indeed have been great; but that under modern conditions of world markets and cheap transport and storage so strong a law of compensation is at work that the variations in the available supply are no longer sufficient to exercise any perceptible influence upon industrial conditions.

The forces of compensation appear to work in three ways—through time, through space, and through the character of the crop. With regard to the first: the evidence is clear that the total supply of any crop available for consumption does not vary so much from year to year as does the annual harvest; and it appears probable that

[1] Notably in the hands of Mr. Hull (*op. cit.*, pp. 43–4).

with the better organisation of markets the tendency towards an equalisation of consumption is on the increase.[1]

In this connection the following figures of the world's wheat supplies are of interest :—

	World's Wheat Crop. M. Qrs.	Visible supplies of Wheat and Flour on Aug. 1.	Available for consumption in Cereal Year (Aug. 1–July 31).	Consumed in Cereal Year.
1894	326·9	21·7	348·6	328·9
1895	305·3	19·7	325·0	309·5
1896	298·4	15·5	313·9	304·3
1897	286·4	9·6	296·0	287·3
1898	366·1	8·7	374·8	358·1
1899	328·4	16·7	345·1	326·4
1900	332·9	18·7	351·6	335·1
1901	348·0	16·5	364·5	352·8
1902	396·9	11·7	408·6	397·6
1903	393·3	11·0	404·0	382·2
1904	362·9	21·8	384·7	364·9
1905	406·6	19·8	426·4	409·9
1906	414·9	16·5	431·5	412·0
1907	368·9	19·4	388·3	376·1
1908	386·7	12·2	398·9	389·0
1909	451·2	9·9	461·1	447·6
1910	442·8	13·5	456·3	436·8
1911	426·0	19·5	445·5	429·8
1912	441·9	15·7	457·6	439·8
1913	483·9	17·8	501·7	—

[1] For instance, "formerly the practice in Argentina was to ship practically the whole surplus in the first seven months of the Argentine cereal year ; for instance, in 1908 out of a total of 17,400,000 quarters, 15,200,000 were exported by the end of July. However, now that futures markets are in existence in Buenos Ayres and Rosario the grower is no longer solely dependent on the export market ; if he thinks well of the future he can hold his actual produce and hedge, if necessary, with futures," i.e., a growing proportion of the Argentine crop is held over into the next cereal year (*Annual Review of the Grain Trade*, 1910, p. 43). Cf. Part I. chap. iii. § 1.

[2] The first two columns are from the *Corn Trade Year-Book* of

The third and fourth columns are calculated on the illegitimate assumption that the invisible reserves remain constant; though even so it is easily seen that the percentage variations in consumption are perceptibly less than those in production. There is, however, reason to suppose that a considerable portion of the year's product is kept in invisible reserve, and that these invisible reserves vary in the same sense as the visible supplies.[1] It seems probable that

1904, and the *Annual Review of the Grain Trade* of 1910 by G. J. S. Broomhall. The other annual reviews are unfortunately out of print. But Mr. Broomhall has kindly supplied me with the missing figures.

[1] How large these hidden reserves are it seems entirely impossible to estimate. In India there is reason to believe that owing

	New Crop.	Carried over on July 1.*	Report on World's Invisible Reserves.
1893 .	60·0 m. quarters	8·1 m. quarters	—
1894 .	66·2 ,,	5·0 ,,	—
1895 .	61·2 ,,	3·2 ,,	—
1896 .	58·7 ,,	5·0 ,,	—
1897 .	73·7 ,,	2·9 ,,	—
1898 .	89·1 ,,	2·2 ,,	—
1899 .	73·0 ,,	8·0 ,,	—
1900 .	75·0 ,,	6·4 ,,	—
1901 .	94·0 ,,	3·9 ,,	—
1902 .	85·0 ,,	6·5 ,,	—
1903 .	71·0 ,,	5·3 ,,	—
1904 .	62·0 ,,	4·6 ,,	—
1905 .	86·0 ,,	3·0 ,,	—
1906 .	92·0 ,,	5·7 ,,	Large
1907 .	79·0 ,,	6·9 ,,	Large
1908 .	83·0 ,,	4·2 ,,	Moderate to fair
1909 .	92·0 ,,	1·9 ,,	Very good
1910 .	79·4 ,,	4·8 ,,	Good
1911 .	77·7 ,,	4·8 ,,	—
1912 .	86·0 ,,	3·0 ,,	—
1913 .	94·2 ,,	4·7 ,,	Scanty

* For 1893–4 the estimate is that of Mr. F. B. Howard, for the subsequent years that of the Washington Bureau of Agriculture (*Corn Trade Year-Book*, 1904, p. 152, and Ann. Reps.). Moreover, the fluctuations in these stocks are greater than those in the visible supplies; and though on some occasions, such as the years ending in 1900 and 1902, when the movements in American production and in the world production were widely different, they are in a different sense, they are much more frequently in the same sense.

if we could take into account the whole of these invisible supplies, the fluctuations in consumption would be very considerably smaller than the table suggests. An expert indeed has given me the unofficial estimate that in recent years a very good world's wheat crop furnishes about thirteen months' and a very bad crop about eleven months' consumption. On this assumption, and taking the smallest and largest crops of the last decade, those of 1907 and 1909, we may estimate the consumption of these years at $\frac{12}{11}$ and $\frac{12}{13}$ respectively of the production, i.e., at 402,387,336 quarters and 416,498,760 quarters. That is to say, the consumption of the worst year of the decade was only about 14 m. quarters or 3·4 per cent. below that of the best year.[1]

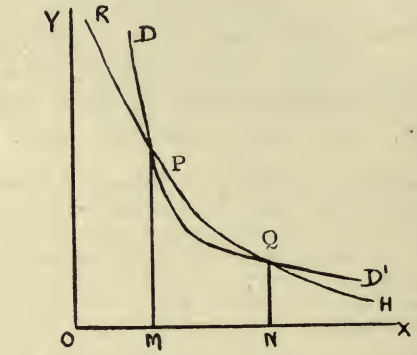
partly to the inadequate facilities for up-country storage the reserves in the hands of the small grower are as a rule very small, since he is unable to hold back his produce from the great merchants, whose stocks are either held at the ports or shipped westward. It must be observed, however, that the "visible supplies" comprise no estimate of stocks in Indian ports. In general the impression that one gets from those conversant with the grain trade is that the hidden supplies are always considerably larger than one would be inclined to expect. In Russia during the shortage of 1911 each successive rise in price sucked hitherto unsuspected reserves upon the market. At the time of the Leiter corner in the spring of 1898, I have been told that farmers in uncouth dress, who had never previously left the backwoods, crowded from all directions into Chicago and New York with their little stocks of wheat to earn the famine prices. Indeed the reserves of American farmers —the only stocks in growers' hands of which there are any trustworthy estimates—are by no means negligible (see table opposite).

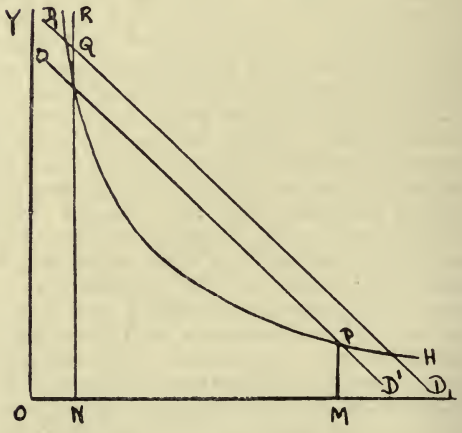
[1] One curious suggestion of an eminent authority (*Corn Trade Year-Book*, 1904, p. 23) seems to require attention at this point. Though the initial effect of lower prices may be to increase stocks, their ultimate effect is, it is suggested, to reduce them; for the farmer, being intent upon raising just enough money to discharge his normal fixed expenses, will have now to put considerably more corn upon the market. And conversely with high prices. If, as is suggested to have been the case in the early 90's, the initial lowering is due to large crops, the result will be to diminish the tendency to equalisation of consumption; though it must be observed that in so far as the effect is supposed to be cumulative from year to year, the argument seems to imply the accumulation of stocks in the hands of somebody. But if, as is hinted of the early nineteen hundreds, the initial raising of prices is due not to

There can be no doubt that inter-temporal compensation of this kind tends to diminish the importance of crop-

small crops but to a raising of the demand schedule, in spite of large crops, the effect would seem to be to increase the tendency to compensation. The argument, however, assumes (1) a curiously molluscan policy on the part of farmers, (2) in the first case rather special conditions of demand on the part of consumers, for neither of which there appears to me to be much evidence.

Cf. the following diagrams :—





In the event of a fall in price having begun, the argument suggests that DD′ is at first inelastic, but ultimately again cuts RH, the rectangular hyperbola through P, at a point Q, at which point

influences in effecting a general industrial revival. At the same time it must be remembered that equalisation of consumption cannot yet be secured without considerable alterations in the ratio of exchange; and that except in so far as the crop is stored by the growers, its arrival (whether or not it is immediately consumed) leads to an absorption in exchange of the stocks of other kinds of goods, and to that concentration of exchangeable resources in the hands of producers which we have judged to be on the whole favourable to industrial revival.[1]

But apart from this inter-temporal compensation it is urged that there is also in modern times so considerable an inter-local compensation that the actual volume of production of a crop whose sources of supply are widely distributed over the globe does not vary greatly from one cereal year to another. This follows partly from the general proposition that the more numerous the independent sources of supply of any commodity, the less will be the variability of that supply, and partly from the deliberate action of man. For instance, the Argentine wheat-crop, reaped in December, is sown in July–August, when more or less trustworthy estimates of the North American crop for the cereal year are already to hand; and the area put under wheat varies to some extent accordingly.[2] And similar variations

sale is restricted; ON being so large as to necessitate a trenching upon stocks.

In the event of a rise in price which is due to an elevation of the demand curve, sale is restricted to ON; Q being a point of intersection of D_1D_1' and RH.

It is possible that DD′ (Fig. 1), D_1D_1' (Fig. 2), only *touches* RH at Q, in which case Q is a point of unstable equilibrium, and the whole process may begin again.

[1] For the sake of completeness, it may be added that the "psychological" influence of good crops in encouraging investment depends primarily on the volume of *production*.

[2] For instance, the poor U.S.A. crops of 1904 and 1908 were accompanied by increases in the Argentine acreage under wheat from 10,550,000 to 12,110,000 and from 14,225,000 to 15,326,000 acres respectively. The remarkable compensatory action of the Argentine in December, 1907, however, was apparently due mainly to natural causes, for the acreage only increased from 14,059,000 to 14,225,000 acres (*Review of Grain Trade*, 1910, p. 42).

of acreage in other parts of the world tend to render it less likely that one year of unusual abundance or shortage will be followed by a second.

There can be no doubt that this compensatory action has a marked effect in diminishing the fluctuations in the world's production of wheat, and that with the opening up of new sources of supply it seems likely to be of increasing importance; and I have heard an eminent authority on the grain trade discourse so eloquently on the fact as to leave the impression that he regarded it almost as a sufficient justification for taking a teleological view of the universe. Yet a reference to the statistics of the world's production will show that the variations are still sufficiently large, especially when we consider the fact just noted that the yields of the several sources are not entirely independent but are to some extent correlated negatively. It becomes therefore of interest to inquire whether there is not also some natural positive correlation calculated to disturb the compensatory action. There seems to me some reason for holding that there is.

The original sun-spot theory of W. S. Jevons has indeed, it is generally admitted, been put out of court by the facts that the sun-spot period has been discovered to be somewhat longer, and the average length of the so-called "trade-cycle" has become considerably shorter since he wrote. Nor do later rehabilitations seem to me quite convincing. Mr. H. S. Jevons[1] indeed asserts that "speaking broadly" the United States wheat harvests are abundant at times of sun-spot minimum and unusually deficient at times of sun-spot maximum; but it is difficult to reconcile this statement with the unusually large harvests of 1884, 1891, 1898, 1905, and the unusual deficiencies of 1881, 1888, 1900 and 1911.[2]

One conceivable alternative hypothesis suggests itself. Mr. Maunder points out that the maximum point is reached

[1] *The Causes of Unemployment*, p. 56.

[2] The latest authoritative sun-spot figures, given by Mr. E. W. Maunder in *Scientia*, Jan., 1913, are worth reproduction here.

early in the sun-spot cycle, in other words that the upward limb of the curve is more steeply inclined than the downward. Is it possible that while the steady decrease in the area of the spots exercises no considerable influence, their final almost complete disappearance and again their rapid and feverish growth produce grave disorders in the sun's constitution which are reflected in violent oscillations in climatic

i.		ii.		iii.		iv.	
1867 ..	65	1879 ..	35	1889 ..	53	1901 ..	5
1868 ..	456	1880 ..	440	1890 ..	99	1902 ..	46
1869 ..	907	1881 ..	681	1891 ..	569	1903 ..	340
1870 ..	1,503	1882 ..	1,000	1892 ..	1,214	1904 ..	488
1871 ..	1,091	1883 ..	1,154	1893 ..	1,464	1905 ..	1,191
1872 ..	—	1884 ..	1,079	1894 ..	1,282	1906 ..	778
1873 ..	—	1885 ..	807	1895 ..	974	1907 ..	1,082
1874 ..	604	1886 ..	381	1896 ..	543	1908 ..	697
1875 ..	248	1887 ..	179	1897 ..	514	1909 ..	692
1876 ..	126	1888 ..	89	1898 ..	375	1910 ..	264
1877 ..	108	1889 ..	26	1899 ..	111	1911 ..	64
1878 ..	22			1900 ..	75		
1879 ..	3			1901 ..	24		
				1902 ..	16		

The figures indicate in millionths of the sun's visible hemisphere the average surface covered during the year. Till 1871 they are from the observations of Spoerer and others, since 1874 from those of Greenwich Observatory. The periods are represented as overlapping, since the spots first appear at the poles and fade away from the equator, the new cycle beginning before the old one is ended.

Even when as in 1870, 1883, 1893 and 1907 on the one hand, and 1889, 1901 and 1912 on the other, the actual year of maximum or minimum bears out Mr. Jevons' contention in an apparently striking fashion, it will be seen that a harvest of the precisely opposite character occurred in the year either immediately or almost immediately preceding, and sometimes also in the year following. Indeed the particular form of periodicity detected by Dr. Shaw in the wheat-yield of the English eastern counties and by Mr. Jevons in that of the United States, consists in an approximate equality of the average yields of any two years equally distant from certain periodically recurring "points of reversal"—the yield of the post-reversal-point year being sometimes greater and sometimes less than that of the pre-reversal-point year. It does not, therefore, seem to indicate such a continuous movement in either direction as we might expect to be attendant upon such a continuous phenomenon as is the enlargement or diminution of the spotted part of the sun's surface.

conditions and consequently in the yields of wheat? Thus would be solved in favour of both parties the controversy between those who, following the Lockyers, believe the radiant heat of the sun to vary directly, and the investigators at the Smithsonian Observatory who believe it to vary inversely with the spotted area.[1] I think an examination of the annexed figures lends some colour, or at any rate some enchantment, to this view.[2]

[1] H. S. Jevons, *op. cit.*, p. 74.

[2] Computed from *Corn Trade Year-Book*, 1904 (pp. 67, 138, 150), supplemented by *Stat. Abs. U.S.A.*, 1912.

	Solar Half-Periods.	Character.	Average Crop.	Average Divergence in either direction from Average Crop.
			In Bushels.	
U.S.A. . .	1866–70	Disturbed	222	32 or 14·4%
	1871–77	Quiet	288	29 ,, 10·1
	1878–83	Disturbed	448	40 ,, 8·9
	1884–87	Quiet	446	44 ,, 9·9*
			Average Yield per Acre.	Average Divergence.
			Bushels.	
	1884–87	Quiet	12·0	0·77 or 6·4%
	1888–93	Disturbed	12·5	1·33 ,, 10·6
	1894–99	Quiet	13·4	0·75 ,, 5·6
	1900–05	Disturbed	13·6	1·05 ,, 7·7
	1906–10	Quiet	14·6	0·64 ,, 4·4
	Solar Half-Periods.	Character.	Average Yield per Acre.	Average Divergence from Average Yield.
			Bushels.	
United Kingdom	1866–70	Disturbed	27·4	3·66 or 13·3%
	1871–77	Quiet	24·9	1·61 ,, 6·5
	1878–83	Disturbed	24·9	3·27 ,, 13·1
	1884–87	Quiet	29·9	1·15 ,, 3·8
	1888–93	Disturbed	28·8	1·91 ,, 6·6
	1894–99	Quiet	31·2	2·48 ,, 7·9
Eastern Counties (Dr. Shaw's figures)	1888–93	Disturbed	29·6	2·8 ,, 9·5
	1894–99	Quiet	32·0	2·9 ,, 9·1

* The steady extension of acreage westward in all probability makes the figure in this column for each period larger compared with that for the immediately preceding period than if figures of yield per acre were available.

But perhaps more interest attaches to Mr. H. S. Jevons' hypothesis of a $3\frac{1}{2}$ years' average period, depending on meteorological conditions as recorded by the readings of barometric pressure. Any attempt indeed to exhibit the wheat crop of the whole world as depending in any direct and simple manner upon some single atmospheric phenomenon seems to me unlikely to succeed. The requirements of the crops in the several countries are too complex and too divergent, and the climatic conditions in the same year differ too much in different parts of the world to admit of any such single comprehensive connecting-link. Accordingly Mr. Jevons' assertion that the curve of the world's wheat production shows " with admirable clearness " the $3\frac{1}{2}$ years' period does not seem altogether convincing in view of the fact that minima occur at intervals of eight years, two years, five years, three years and four years respectively.

	Solar Half-Periods.	Character.	Average Yield per Acre.	Average Divergence from Average Yield.
			Bushels.	
France . .	1866–69*	Disturbed	15·6	2·15 or 13·8%
	1871–77	Quiet	16·4	2·27 ,, 13·8*
	1878–83	Disturbed	16·1	1·53 ,, 9·5
	1884–87	Quiet	17·6	0·25 ,, 1·4
	1888–93	Disturbed	16·5	1·13 ,, 6·8
	1894–99	Quiet	19·8	0·58 ,, 2·9†

The hypothesis is of course not proved, nor would it in any case furnish a complete explanation ; but that is more than either we desire or deserve from any climatic theory of fluctuations. E.g., the collapse of 1900, the minor cycle 1902–3, and the initiation of the 1907 boom all belong to one disturbance-period, the 1907 collapse falling outside it. Similarly the fruits of the wind are reaped and the seeds of the whirlwind sown in the single disturbance-period 1866–70. But it is suggested that some light is thrown on the long stretches of comparative industrial quiet occurring in the late-central 70's, 80's and 90's and followed by storms. Nor would it be right to conclude without a warning that we have recently entered upon a disturbance-period.

* No figures for 1870. The yield per acre in 1871 was probably abnormally reduced by shortage of labour, etc. ; the figures for 1872–7 yield 2·25 : 17·1 or 12·6 per cent.

† Ignoring the wholly exceptional dearth of 1897.

Nor does it seem at first sight that the attempt to prove a natural correlation between the crops even of any two producing countries is likely to be much more fruitful. The climatic conditions and requirements of the United Kingdom and France ought to be very similar; yet an examination of the curves of the average yield per acre in the two countries from 1881 to 1903 shows that they do not move in the same direction more than fifteen times out of twenty-three. The connection, however, appears to be closer than that between the United Kingdom and the United States, for which the curves move together thirteen times, and than that between France and the United States, for which they move together ten times. Figures of yield per acre are not available for other countries, but it may be noted that in the thirty-one years 1882–1912 the curves of production of France and Russia moved together seventeen times, those of France and the United States fourteen times, those of Russia and the United States only twelve times.

Now these facts are not of themselves sufficient to prove anything (the movements, for instance, in the same direction are often very large in one country and almost imperceptible in the other) and it would serve no purpose to extend the calculation to the other principal growers. They do, however, suggest that country A may have a nearer affinity in the matter both of climatic conditions and of requirements with country B than with C, so that there is a somewhat greater probability of the productivity of A and B being similarly affected in any given year. In particular it seems clear that though in all countries the crops require a moist seeding and growing time, and a dry spell for ripening and harvest, the relative importance of these requirements is not the same, so that it is possible to say that a year of unusually heavy rainfall throughout the world will on the whole benefit some countries, such as Canada, the Argentine, Russia, Australia and India, and injure others, such as the United Kingdom, France and the United States.[1] Thus the great

[1] This hypothesis and classification is suggested by Brückner's conclusion, that "The British Isles, France, Germany, Austria,

crop shortage of 1897, for instance, seems to have been mainly due to the failure of the rain-hating European countries of the Anglo-French type: while the accompanying cold prevented the northerly crops of Russia from obtaining the full benefit of the moisture, the rain-loving countries nearer the Equator—the Argentine, India, and Australia—did very well. In 1907 and 1911 on the other hand the shortage was mainly due to the drought-hating countries, most of which suffered severely; while the European countries did fairly well, and in 1907 France beat all previous and in 1911 England all recent records.

This comparison suggests a conjecture of some interest. Until recent years the predominant position among the world's wheat-growers was, with the important exception of Russia, held by the rain-hating countries of Western Europe and the United States. Recently, however, the rain-loving countries have been rapidly growing in relative importance, and seem likely to continue to do so. Nor are there wanting indications of apostasy in the United States themselves. There have been and still are at work in that country two important trans-cyclical changes in the cultivation of wheat. The states and territories whose production is increasing most rapidly are many of them, such as Nebraska, the Dakotas, Colorado, Washington, Idaho, Montana, Utah, devoted to the growth of spring wheat, while the cultivation of the older eastern states and of

Scandinavia and the Atlantic coast States of North America have an 'oceanic' climate; Central and Southern Russia, and the great central area of North America, have a 'continental' climate. During cool damp periods the crops of the former countries tend to be spoiled by too much wet, whilst those of the continental area are excellent, having just sufficient moisture. On the other hand during warm dry periods the harvests are on the average more abundant in 'oceanic' territory, and deficient through drought in the hot, dry, continental areas" (Jevons, *op. cit.*, p. 76). On the connection of the Indian rains with harvests and prices, cf. F. J. Atkinson, *Silver Prices in India*, 1897, pp. 95 ff. This suggestion is borne out by such a detailed life-history of the various crops as is given in Mr. Broomhall's publications. The following summary, for instance, of the conditions in certain specimen years seems legitimate.

western states such as California which grow the winter

	U.S.A.	Canada.	Russia.	France.	Argentine	Australia.	India.	United Kingdom.
1901	Warm winter: summer dry and hot. Result very good.	Heat and moisture causing some rust and sprouting. Nevertheless Result very good.	Dry weather hinders seeding: warm winter beneficial, summer too hot and dry. Result poor.	Winter first too wet and warm, then too cold. Great heat with storms in summer. Result poor.	Drought and heat. Harvest weather good, but Result bad.	Too dry and hot. Result bad.	Failure of monsoon and winter rains. Result poor.	Too cold and dry in spring. Result poor.
1902	Some winter kill—too cold: otherwise favourable. Result very fair.	No drought. Result very good.	No drought Result very good.	Great heat in July: nevertheless Result good.	Good rains. Result good.	Continuous drought. Result very bad.	Good monsoon and winter rains. Result good.	Too cold and sunless in spring and early summer, but good forcing weather later. Result ter.
1903	Continuous heavy rains. Result very poor.	Some drought. Result not so good.	Some drought in spring, relieved by rans. Heavy rains in July cause anxiety, but Result very good.	Cold and dry: but Result very good.	Frost does little harm. No drought. Result very good.	Much moisture ('Minor complaints of rust'). Result very good.	Good monsoon and winter rains. Result very good.	Cold and wet. Result poor.
1910	Winter too severe for winter, summer too dry for spring crop. Result only fair.	Great heat and drought in summer. Result disappointing.	Very wet winter, spring and harvest. Quality poor owing to early drought and harvest rains, but as to size of crop, in spite of gloomy estimates, Result very good.	Extreme wet and cold. Result very poor.	Severe drought especially in the north. Estimates unduly favourable, and Result poor.	Late sowing through drought, but heavy rains later. Result very good.	Monsoons abundant. Results very good.	Summer wet and cold. Result disappointing.

Two complicating features must be observed. First the conditions of rainfall are not by any means the same throughout the world. Thus 1902 was on the whole a wet year, but there was not too much rain in England or France, and there was continuous drought in Australia. 1903, again, was on the whole very wet, but was dry enough to produce good crops in France, while there was some drought in Canada. 1910 seems to have been dry on the whole in the western and wet in the eastern hemisphere.

variety is of decreasing relative importance.[1] Now it seems that the fine dry summer weather which brings the winter crops to maturity may sometimes check the early growth of the spring-sown crop: this was noticeably the case in 1910 and 1911.[2] Moreover, these spring-wheat-growing countries are situated mainly in the great central area of North America which according to Brückner has a "continental climate" and is more liable to damage from drought than from excessive moisture. America, therefore, is gradually tending more and more to grow a kind of wheat that is liable to suffer from drought upon a soil that is liable to suffer from drought.

In this connection it should be observed that for the United States at least Mr. H. S. Jevons' hypothesis of a $3\frac{1}{2}$ years' periodicity seems not devoid of foundation. The conception of a three or four years' period is indeed a dangerous one to play with; it is apt to mean little more than that the curve neither presents a regular dog-tooth alternation from year to year nor moves for many years together in one direction. Nevertheless it is true that since 1885 wheat crop minima have only once and maxima only twice been separated by an interval of more than four or less than three years; and the fact that Mr. Jevons finds a correlation coefficient of $-\cdot437$, with probable error $\cdot101$, between the *actual* movements of his curve of the total agricultural produce of the U.S.A. and the curve of the average barometric pressure during April to October at Cordoba in the Argentine,[3] suggests that the close correspondence which he detects between *the average* periods of variation of the two curves is not purely fortuitous, but

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Secondly, the conditions of rainfall are complicated by conditions of temperature. The dry weather of 1901 was accompanied in England by cold, and the English crop therefore suffered. Canada suffers even more from cold than from drought. England abhors cold more than France.

[1] Cf. the figures in *Corn Trade Year-Book*, 1904, pp. 153–4, with those in *Stat. Abs. U.S.A.*, 1912, pp. 133–5.

[2] Cf. *Review of Grain Trade*, 1910, p. 12, and *Economist*, 1911, ii. p. 167.

[3] Jevons, *op. cit.*, p. 63.

that both phenomena are controlled by a real if somewhat erratic periodic law. This result confirms the ascription to the United States of a rain-hating character in the past, for a low pressure inland is connected with an increase in the sun's heat ;[1] but it must be observed that in 1904–5–6 the curves both of wheat and of total produce moved not inversely but directly with the Cordoba pressure curve, and that it is possible that the pressure figures since 1907 would furnish evidence of that change which we have just seen reason to suspect in the temperament of the American wheat crop.[2]

Is it not then possible that the comparative stability of the world's annual wheat crop which at present excites the pious wonder of observers is a temporary phase due to the approximate balancing of two influences, and destined to vanish as the rain-lovers get a firmer grip upon the rope ? The future alone can give a convincing answer ; for the present the general conclusion seems to be that while there

[1] *Ibid.*, p. 75.

[2] The Cordoba monthly averages do not appear to have been computed since 1907 ; but at the Meteorological Office in South Kensington I have obtained those for Santiago in Chili (situated also on the high ground of South America, though on the other side of the Andes) up till 1909 ; to judge from the figures from 1894–1906 * they are directly correlated with those for Cordoba. It will be seen that in 1906–9 they move in the *same* direction as the United States wheat crop (falling with it, unlike the Cordoba figures, in 1907). This seems, so far as it goes, to be important evidence in favour of the hypothesis of a recent reversal of Mr. Jevons' law.

Average monthly pressure at Santiago in the six months April–September.

1894 . .	718·28 millimetres	1902 . .	?
1895 . .	718·02 ,,	1903 . .	718·08 millimetres
1896 . .	717·64 ,,	1904 . .	717·20* ,,
1897 . .	718·04 ,,	1905 . .	717·16 ,,
1898 . .	717·08 ,,	1906 . .	718·28 ,,
1899 . .	716·36 ,,	1907 . .	717·94 ,,
1900 . .	716·46 ,,	1908 . .	718·30 ,,
1901 . .	?	1909 . .	718·56 ,,

* Those for 1901–2 are missing. That for 1904 is computed on the assumption that the average April–September bears the same relation to the average April–August in 1904 as in 1905 (the figure for September, 1904, being missing) ; it is therefore liable to error.

has been recently a considerable and hitherto an increasing tendency to inter-local compensation, it is not clear that the fluctuations in aggregate annual production are not still sufficiently large to exercise an appreciable effect on the course of industry.[1]

It remains to consider the third form of alleged compensation—that afforded in the same country in the same year by diversity of crops. Mr. H. S. Jevons in the work already referred to has, I think, shown conclusively that in the United States this inter-specific compensation is far from complete. If we concentrate upon the three leading crops, we find that in the twenty-seven years 1885–1911,

Wheat and corn moved together fifteen times, and attained common maxima three times;

Wheat and cotton moved together eleven times, and attained common maxima five times;

Cotton and corn moved together seventeen times, and attained common maxima five times.

A comparison of the yields per acre of corn and wheat for the same years is equally inconclusive; all that can be said is that certain years, such as 1889, 1891, 1895, 1898, 1906, seem to have been generally favourable and others, such as 1890, 1893, 1903, generally unfavourable to cereal production. It does not seem to me, however, that any more definite conclusion than this is needed in order to establish the probability of the influence of fluctuations in the volume of crops upon industrial activity.

In India there is considerable diversion of area between

[1] Further, it may be noted that if it prevents so large an increase in total crops that the effort-demand becomes inelastic, the existence of partial compensation in a year which is good on the whole may actually aggravate the tendency to industrial fluctuation: contrast 1882–4, when the very universality of the big crops prevented the outbreak of constructional boom (cf. H. S. Jevons, *op. cit.*, and Piatt Andrew, *op. cit.*, p. 330). Finally, owing to the differences in the economic freedom enjoyed by different producers, a transference of the source of supply does not necessarily leave industry as a whole any more than any particular industry unaffected.

one crop and another from year to year, especially between rice and jute, but the two chief food-grains, rice and wheat, show a marked tendency to reach their minimum in the same year, though the maxima often diverge by one year. It is very rare, however, for a maximum in one crop to be accompanied by a large diminution in the other.

Again in Germany, the wheat crop reached well-defined maxima in—

1878, 1882, 1887, 1890, 1892, 1896, 1899, 1902, 1904, 1906, 1908, 1910,

the rye crop in—

1878, 1882, 1887, 1890, 1893, 1896, 1899, 1904, 1909.

The wheat crop shows well-defined minima in—

1879, 1881, 1883, 1889, 1891, 1895, 1897, 1901, 1905, 1907,

the rye crop in—

1880, 1884, 1889, 1891, 1895, 1897, 1901, 1905.

In the Argentine, however, there are fairly clear indications of a tendency to negative correlation. Mr. Broomhall thus summarises the results of the (British cereal) years 1887–1903.[1]

	Wheat.	Corn.		Wheat.	Corn.
1887	Success	Failure	1895	Success	Failure
1888	Failure	Success	1896	Failure	Failure
1889	Disappointing	Success	1897	Failure	Disappointing
1890	Disappointing	Failure	1898	Success	Success
			1899	Great success	Disappointing
1891	Disappointing	Success			
			1900	Disappointing	Disappointing
1892	Success	Failure			
1893	Great success	Failure	1901	Disappointing	Disappointing
1894	Disappointing	Success	1902	Success	Great success

[1] *Corn Trade Year-Book*, 1904, p. 32.

And from his later figures [1] we may continue—

	Wheat.	Corn.		Wheat.	Corn.
1903	Success	Great success	1909	Failure	Success
1904	Success	Disappointing	1910	Failure	Failure
			1911	Disappointing	Success
1905	Failure	Great success			
1906	Great success	Failure	1912	Success	Success
1907	Great success	Failure	1913	Failure	Success
1908	Failure	Success			

If we reckon disappointments as failures, the results differ in seventeen years out of twenty-seven and correspond only in ten. This phenomenon I think suggests that corn being on the whole a heat-loving crop, its conditions of production are likely to differ more widely from those of wheat on a rain-loving soil like the Argentine than in an (on the whole) heat-loving country like the United States.

Even complete inter-specific compensation of volume would not, however, be sufficient to destroy the theory of crop influences: for the effect of an increase in the more valuable and important crop will not be cancelled by an equal decrease in the less valuable and important.[2]

[1] *Review of Grain Trade*, 1910, p. 42, and information kindly communicated.

[2] Indeed where, as in the Argentine, the "psychological" importance of crop conditions is great, inter-specific compensation may actually tend to prolong and intensify an industrial revival. For while it requires a boom in the more important product to sow the seeds of confidence, yet when men's minds are already impregnated with optimism, the boom in the less important is sufficient to outweigh the failure of the more important crop. Thus though the Argentine wheat crops of December, 1888 and 1889, and again of December, 1894 and 1895, were bad, the maize crops, which had been poor in March, 1888, and March, 1893 and 1894, were excellent in March, 1889 and 1890, and in March, 1894 and 1895, and on each occasion helped to swell the industrial boom. An additional explanation is thus furnished of the lag of iron and steel imports behind wheat exports (cf. p. 87).

§ 5. THE INCREASED ATTRACTIVENESS OF INVESTMENT.

We have thus, by means of a tedious but unavoidable digression, established the theoretical probability of the importance of agricultural influences in causing a general industrial revival. In view of the detailed discussion in Part I. chaps. v.–vii. nothing more need be said as to the channels by which they actually operate, and we pass on to the third possible cause of a general increase in prosperity —a rise in the satisfaction-bearing power of the goods which are the subject of mutual exchange. There seems indeed at first sight no reason to suppose that the estimate which people form of the satisfaction afforded them by the consumption of goods should be thus subject to variation: but we have to explain the undoubted fact that at times of business revival a number of goods which had previously been withheld in store are drawn into the circle of exchange.

Now an alternative explanation of this fact at once occurs. While a general rise in the exchange values of all consumable goods in terms of each other is clearly impossible, it is perfectly possible that each group of producers or owners should *expect* a rise in the value of its own products, and consequently be willing to withdraw them from store. Moreover, the existence of a monetary economy affords a mechanism by which such an expectation may be raised simultaneously in many trades. This question, however, may conveniently be reserved for discussion, along with other aspects of a monetary economy, in a separate chapter: at present we are concerned to note that with regard to certain products which enter into exchange, the suggestion of a general rise in their satisfaction-bearing power is by no means without foundation.

For while the marginal utility to them of *consumptive* goods is a thing about which most people are capable of forming fairly accurate and stable judgments, their estimate of the marginal utility of *construction* goods is by no means so likely to be constant. For this estimate depends on the

expected future marginal productivity of those goods; and since both this productivity itself is liable to variation, and also any forecast of it is at best a matter of guess-work, there is clearly room for considerable variation in the estimates formed of the marginal utility of construction goods. It is the author's conviction that it is these variations which furnish the key to the most important aspects of modern industrial fluctuations. The most characteristic feature of a modern industrial boom is the utilisation of an abnormally large proportion both of the past accumulations and of the current production of consumable goods to elicit the production not of other consumable goods but of construction goods.

Among the most important causes of such a revision of the marginal utility of construction goods may be mentioned first the confidence inspired by exceptionally good crops in the capabilities of a given country; secondly, the wearing out of an unusually large number of the instruments of production in some important trade or group of trades: and thirdly, the occurrence of an invention [1] in some important trade or group of trades. The two first have already been sufficiently discussed: [2] about the third more remains to be said.

The magnitude of the effect of an invention upon the volume of general industrial activity depends upon the character of the invention and the circumstances in which it is introduced. It is likely in the first place to be greater the more prone the community in question to give heed to the solicitations of permanent investment. We have already had occasion to refer the very different course of the German, English, and American electrical booms of the later 90's to the more forward policy of the German banks: it only remains to add that the same factor helps to explain how in Germany the investment bacillus spread

[1] I use the word to include "legal" as well as physical inventions (cf. Part I. chap. i. § 2), but the discussion will deal mainly with the latter.

[2] Part I. chap. ii. § 2 and chap. v. § 2.

not only to the copper and electrical but to the constructional industries in general, while in America the latter continued to wait for the blessing of Nature, and in England to cry out for the caresses of America and of the sea.

Secondly, the effect is likely to be greater the more numerous and important the constructional industries physically involved. Apart from a lowering of their own cost of production, already discussed,[1] the great central constructional industries of iron and steel may, it would seem, be involved in two ways. First, the invention may be concerned with a product which requires carriage over long distances, and so stimulate the industries making the instruments of transport. Thus the copper boom in America in 1906–7 led to a shortage of cars which increased the demands upon the steel industry.[2] Thus also the demand for the over-sea transport of oil in 1911–2 was one of the principal causes of the recent boom in British shipbuilding.[3] Secondly, the invention may require the direct co-operation of the iron and steel trades for its application—indeed it is pretty certain that it will, but it may do so in very different degrees. In this connection the contrast between the German iron and steel booms of 1895–1900 and 1904–7 is instructive. The former was much more intense, and the crisis correspondingly severe. On both occasions the initial impulse was given by electrical invention ; but in the former

[1] Part I. chap. iii. § 3.

[2] In Germany in the same year the demand for *steel* led to a shortage of cars, and so to a demand for more steel ; just as in 1880 and again in 1906 the English shipping and shipbuilding boom was prolonged by the very imports of iron-ore that were destined to destroy it (cf. *Ec.*, 1906, p. 43).

[3] Though the world's production of oil increased largely in 1912, it was only in California that any large accumulation could at first be built up (*Daily Chronicle*, June 21, 1913). By August, 1912, petroleum freights from New York to Europe had reached 70*s.* a ton, as compared with 10*s.* or 12*s.* a year earlier (*Statist*, Aug. 10, 1913).

Of 108 vessels under construction at the end of December, 1912 forty, with an aggregate tonnage of 231,000 tons, were tankers, (*Lloyd's Register Annual Summary* for 1912, p. 4. Cf. Moss *Circular*, Jan. 1, 1913).

case the leading feature was the application of electricity to local transport, which required the physical conjunction or juxtaposition on a large scale of iron or steel and copper in electrical permanent ways, vehicles and power-generating stations : while on the latter occasion it was the application of electricity to processes of manufacture, which required [1] the co-operation of a much smaller amount of new iron and steel construction. Similarly the inverse movement of pig-iron and copper consumption in Germany in 1910 and again in America in 1912 suggests that when, as in these years, the most important application of electricity is in the electrification of existing long-distance railroads, the effect upon the iron and steel trades is naturally likely to be less than when (as in Germany in 1895–1900) it is in the construction of new local tracks.

In this connection it is naturally of interest to inquire how far the other great power-invention of recent years—the discovery of the potentialities of oil—is to be held responsible for the most recent industrial boom.[2] By 1909 the idea of oil-fuel had begun to take hold of the public mind, and it only needed a contract of the Admiralty with the Scotch companies in February, 1910, to set the train alight. The immense extension of supply and the struggle

[1] Though, indeed, it seems to have received considerably more than it required (see below, chap. ii. p. 185).

[2] With regard to the boom of 1906–7 it seems pretty clear that the rise of oil prices in 1906–7 was in part due to phenomena of supply, and in part a mere reflex of the constructional boom, operating chiefly through an increased demand for pleasure-cars. The London Omnibus companies, indeed, with a far-sighted folly recalling that of the unhappy Lord Revelstoke, adopted motor-power in 1905 ; but it was the demand for pleasure and not for commercial purposes that first raised the price of motor spirit. In 1906 " the energies of our manufacturers were absorbed in the demand for the higher priced cars," and of the 71,000 vehicles estimated to be in existence at the end of that year, only one-seventh were said to be for commercial uses (*Ec.*, 1906, ii. 1,864). The commercial demand, however, continued to expand when the pleasure demand contracted after the troubles of October, 1907—in 1908, for instance, there were 200 more motor-buses in commission in this country than in 1907 (*Ec. H.* of 1908)—and helped to maintain oil prices in 1907–8 and to check their fall in 1908–9.

for the markets of the world between the Standard and the Shell-Royal-Dutch led indeed to a prolonged slump in oil prices in 1910–1; but the subsequent sharp rise [1] was no doubt attributed by the public mind to a large increase [2] in the use of heavy oil for transport-fuel (both in internal combustion engines and for steam raising), such as might be expected to have an important effect on the constructional industries. Nevertheless the use of the internal combustion engine does not seem, in fact, to have made great progress at this time.[3] Nor did consumption for steam-raising make very large strides: the majority of tramp-owners, from whom most was expected, do not seem to have been in a position to make the considerable alterations in boiler-construction, etc., which are required.[4] Indeed there

[1] The price of petroleum in England rose in 1910 from 5⅞*d.* a gallon to 6*d.* on May 14, whence it fell steadily to 5*d.* in July, 1911, rising to 5⅞*d.* in December, 6⅜*d.* in January, and 9⅛*d.* in March, 1912. One authority indeed (*Statist*, Oct. 21, 1911) attributes the rise entirely to cost, "all the conditions [of demand] being in favour of lower prices," and the conclusion of the oil-war, the crippling of the Standard by the adverse judgment of the American courts, the increased cost of handling at the ports, the flooding of the Galician mines, and (most important of all) the difficulty of transport were all invoked. But there is no reason to suspect any actual diminution of oil-carrying tonnage, and Mr. von Ofenheim seems justified in pointing out that since "crude oil has risen 50 and 100 per cent. on the fields" (*Statist*, July 20, 1913) the whole responsibility cannot be laid upon freights.

[2] Fostered both by the anticipation and the event of the great coal strike.

[3] In 1910, according to the *Engineer*, the advance of the internal combustion engine had not been very rapid, and though in 1911 some important experiments were made, and the first Transatlantic voyage was performed by a Diesel-engined ship, the *Toiler*, the aggregate demand for internal combustion purposes cannot have greatly increased. Of the 655 new vessels classed by Lloyd's Register in 1912, only six were fitted with oil engines; and of the vessels of over 3,000 tons under construction at the end of the year, only two in England and ten abroad were similarly equipped (Lloyd's Register Statistical Tables and Annual Return of 1912).

[4] By August, 1912, there had been "no increase to any very material extent in the consumption of oil as fuel for steam-raising purposes" (*Statist*, Aug. 31, 1912), and of the steamers built and under construction in 1913 which were fitted for the consumption

is some reason for thinking that it was not the heavier but the lighter oils that dictated the rise,[1] and for holding with Mr. Benjamin Taylor [2] that the vast extension of the production of heavy oils was unwarranted, and bound to lead to disastrous reaction. On the other hand there is now abundant direct evidence of the increasing consumption of oil fuel, and that not only for naval purposes: [3] and a strong presumption that as a steady and abundant supply is assured,[4] its use will enormously expand. The important

of oil, the greater part were themselves designed for the carriage of oil for the hypothetical consumption of other vessels.

[1] It was the prices of burning oil and motor spirit—American petrol and Scottish naphtha—which showed the first symptoms of recovery (*Economist*, 1912, i. p. 66). The motor industry which, with the steady growth of commercial uses, had never suffered severely in the post-1907 relapse, took a new lease of life in 1910 with the development of the taxi-cab. On small pleasure and fishing boats the use of auxiliary motors consuming light spirit made steady progress (*The Engineer*, apud *Economist* history of 1910. Cf. also *Economist*, 1912, i. p. 903. Cf. also the influence of home agriculture, discussed on p. 106).

Nevertheless it is perhaps significant that it was the Standard, which concentrated its attack upon kerosene, and was unable to compete in the heavy oils, that had to make peace in 1911. Moreover, an increased demand for petrol would naturally, and at first in fact did (*Statist*, Oct. 21, 1911), lead to an actual reduction in the price of fuel oil; for though a certain amount of crude petroleum is used for fuel purposes, its use is restricted by the flash-point regulations in force in various countries, and the majority of the oil used as fuel consists of the residual substance left after the distillation of the lighter products (cf. *Encyc. Brit.*, article Fuel). The production of motor spirit and of fuel oil are therefore joint rather than rival operations; hence the rise in heavy oils seems to need explanation from the side of demand. (For the prosperity of fishing and agriculture in these years, cf. p. 203, n. 1).

[2] "The Fallacy of the Oil Boom" (*Financial Review of Reviews*, Sept. 1912, pp. 35 ff.).

[3] The experiences of the Mexican railways, which saved $250,000 in the year 1911–2, almost entirely by the substitution of oil for coal power, and by the subsidiary economies in handling and carriage of fuel and in cleaning, are significant and are not likely to remain unimitated (Annual report, published in *Statist*, April 27, 1912).

[4] Mr. Taylor (*op. cit.*, p. 45) overlooks this important consideration. "There is probably more petroleum oil in the bowels of the earth," he states, "than there is coal in its veins; but while we have the coal at command we have not the oil. And the quan-

conclusion, therefore, emerges that the influence of the oil invention upon the great central constructional industries has hitherto been exercised mainly through the subsidiary channel of demand for the instruments of oil transport, and that its full and direct effects remain yet to be experienced in the immediate future.[1]

In conclusion, it is necessary to issue a word of caution as to the true nature of a "general" industrial revival. Neither a revival of the second [2] nor of the third type discussed in this chapter involves any increase in the consump-

tity of oil now being produced and feverishly prepared is far more than the industrial and marine world can possibly consume." In his anatomical enthusiasm he fails to see that the implications of these statements as they stand are mutually destructive. It is possible that the consuming power of the world is small simply because the oil is not yet completely at command; and that the "feverish preparation" by increasing our "command" is increasing also the world's consuming power. Thus the prospectus of the Oilfields Finance Corporation (quoted in *Statist*, Feb. 10, 1912) plausibly urges that "the more general adoption of oil fuel has in the past been retarded by the uncertainty of a regular supply, which recent developments and the expansion of production necessarily arising from the further large investments of capital in petroleum will do much to obviate." In other words, in the case of products which are of first importance not only in the constructive but in the operative stage of industry, increased production may have the apparently paradoxical effect of raising the price. The apparent ὕστερον πρότερον of the speculative investors in the low-priced year 1910 may have been the only far-sighted policy.

[1] Cf. *Ec.*, 1912, i. p. 66, on the eccentricity of the Scottish oil trade: "it will probably not be so in the future, for the whole trade is altering in its relation to the industrial situation."

At first indeed there will be more demand for structural alteration than for new construction; and the steel trade may even at first suffer on the balance by a reduced demand for boilers, etc., consequent on the adoption of the internal combustion engine.

[2] This generalisation does not, however, apply to a single country. If, for instance, the country is one whose demand for corn is inelastic, while its products are in great demand by corn producers, both those engaged therein is constructional and in consumptive industry may well be enabled to enlarge their consumption of consumable goods; cf. England in 1906 and 1912–3. This result will be modified to the extent that the country's non-corn producers are dependent on foreign customers whose demand for corn is not inelastic: contrast the United States, where the agricultural exports form a large proportion of the whole.

tion of consumable goods by the producers of consumable goods taken as a whole.[1] A revival of the first type does at first involve such an increase, but so soon as it leads to a general extension of investment, that increase, owing to the miscalculation which accompanies the process of investment,[2] is liable to be succeeded by a diminution. Furthermore neither (at this second stage) the first type nor the second type necessarily involves an increased *aggregate* consumption of consumable goods.[3] These considerations both suggest some disquieting reflections as to the true nature of an industrial boom, and explain why (so far as our evidence may be trusted) a year of constructional revival is frequently marked by a diminution in the con-

[1] Of course *certain* groups of consumptive producers will benefit; N.B., especially the dependence of the Lancashire cotton spinning trade on continental constructional industry, evidenced especially by the high level of profits in the early 80's and by the survival of spinning over weaving in the summer of 1907.

[2] Cf. Part I. chap. i.

[3] The third type does involve such an increase, but the increase may be obscured and delayed. For while we still postpone the essential modifications introduced by the existence of a money economy, attention must be called to the way in which it both interprets and obscures the fundamental process now under discussion. In one respect it renders clearer the real nature of the change which is taking place. In a non-monetary economy the deliberate collection of large stores of consumable goods would be a necessary preliminary to engaging in constructional enterprise, and the increased advantage of the possession of consumable goods would be the first fact to attract public attention. But in a monetary economy, as Mr. Hull rather irritably complains, a great corporation does not prepare to build a railroad "by collecting a huge quantity of flour, meat, molasses, etc., with which to pay its workers"; the provision of increased supplies of consumable goods is postponed until the producers of constructional goods are actually spending their increased money incomes, and it is more plain than it otherwise would have been that the increased advantage of the possession of *constructional* goods is the fact of primary importance.

On the other hand, the same interposition of a money mechanism obscures and delays that increased *aggregate* consumption of consumable goods which we have seen to be an essential feature of the situation; for the relapse of the money-demand of those who are turning their attention from consumption to investment is not immediately compensated by the increased money-demand of those engaged in constructional industry.

sumption of consumable goods. Thus the curve of English food-consumption (Chart X.) fell in the years of constructional outburst, 1880, 1888, 1905 and 1910; similarly the wool trade was in difficulties in 1872, 1880, 1905 and 1911. Thus also the American coffee-consumption curve (Chart XII.) relapsed in the (fiscal) years of constructional revival, 1887, 1890, 1896, 1906 and 1910. Once the shibboleth of "repercussion" is discarded, a wide field for scepticism as to the identity even of "general revival" with universal prosperity bursts upon the view.

CHAPTER II.

Crisis and Depression.

§ 1. AGRICULTURAL SHORTAGE.

We pass on to an investigation of the crisis or turning point of the industrial cycle, that is of the forces which put an end to the progress of general revival. Following the classification adopted in the last chapter, we may consider first the steady growth of real costs. Elaborate discussion is hardly necessary, but special attention may be drawn to the prevalence, in times of activity, of wasteful methods of production and organisation, to the use of incompetent and over-tired labour of all classes, and to the necessity of resource to less accessible sources of mineral supply. There seems no reason to doubt that in such ways each period of expansion carries in itself the seeds of its own dissolution.[1]

More obvious and catastrophic is the effect of agricultural shortage: for arguments of the same character as those which confirmed the *primâ facie* inference of the beneficial effect of large crops confirm also the *primâ facie* inference of the harmful effect of small crops upon the volume of general industrial activity. Returning to the analysis of chap. i. § 3, we see that the effect of crop-shortage in time of prosperity depends (1) upon the elasticity of effort-demand for corn, (2) upon the other factors enumerated on p. 132. (1) There seems indeed to be a greater probability than in the case of crop-abundance that the demand will be inelastic: for though (i.) since at such a time everybody is likely to be working at full stretch, the rate of increase of

[1] For a good discussion, see Mitchell, *Business Cycles*, pp. 475–83; cf. also Aftalion, Vol. I. Book III. chaps. ii.–vii.

the marginal disutility of effort will be fast—a factor making for a small expenditure of effort on corn,[1] yet (ii.) as with commodities in general so with corn the rate of change of marginal utility is likely to be more rapid for a fall than for a rise in consumption. (2) Though an increase in aggregate activity is thus indicated (cf. also 2, i. in chap. i. § 3) it must be borne in mind (2, ii.) that since everybody is *ex hypothesi* fairly well off, those whose demand for corn is inelastic and who are therefore obliged to reduce their expenditure on other things, are likely (since they will not be obliged to retrench on necessaries) to reduce that expenditure by a comparatively large amount: while those whose demand for corn is elastic, and who are therefore enlarging their expenditure on other things are likely (since they are already living in comparative comfort) to enlarge that expenditure by only a comparatively small amount.[2] Further (2, iii.), since in times of great activity everybody is likely to be working at full pressure and near the limit of the possible expenditure of energy, the rate of change of the marginal utility of effort is likely to be greater to those who are increasing than to those who are diminishing their aggregate expenditure.[3] For both these reasons the increase of aggregate expenditure by the former is likely to be small compared to the decrease of aggregate expenditure by the latter. Supposing, for instance, that the commodity-receipts of corn-producers are increased as much by Hemichoros α as they are diminished by Hemichoros β, there is reason to suspect a net *decrease* both of general production and also of the mutual consumption by the industrial population of each other's products.

Finally, it should be noted that the harmful "psycho-

[1] On the other hand, the rate of increase of marginal utility of stocks is likely to be slow, that utility, at a time of depletion of stocks, being already almost infinitely high.

[2] In terms of the figure (p. 132), the general argument that UU_1 is steeper to the left than to the right of the existing equilibrium point is liable to be modified.

[3] EE_1 is likely to be steeper to the right than to the left of the existing equilibrium point.

logical" effects of a crop shortage upon constructional industry discussed in Book I. ch. v. § 2, to which reference should here be made, are operative (in the absence of any counterbalancing influence) upon the volume of industrial activity taken as a whole.

These conclusions give rise to an attractive suggestion. Is it not possible that the whole cause and meaning of industrial crisis and depression is a dislocation of the ratio of exchange between agricultural and industrial products leading to an increased consumption by agriculturalists and a diminished consumption by industrialists ?[1] In particular this explanation seems to fit well the circumstances of the collapse and depression of 1907–8.[2] In 1907 in America the prosperity of the agricultural community was the chief redeeming feature of the situation; "if the Wall Street speculator has suffered cruelly, the farmer of the West, the Centre and the South is in a better position than ever."[3] While the demand for various manufactured articles such as hardware and shoes,[4] as well as constructional goods, had broken by July, 1907, there was an increasing activity in cereals, meat, and many other varieties of food products,[5] and "a steady request for wool and sugar."[6] Similarly in England in 1908 "the farmer has hardly felt at all the effects of the prevailing depression": [7] and in that year the great provision companies were among the few prom-

[1] Such a dislocation might be due not only to a sudden shortage, but to a prolonged over-investment in agricultural as compared with manufacturing enterprise. Cf. a correspondent of the *Economist* (1909, p. 1337): "The modern capitalist is a great deal more interested in producing millions of tons of steel per annum or millions of yards of cotton cloth than in raising food . . . for the people. . . . Tens of millions of British capital which our soil is urgently calling for are being blindly frittered away on things of purely conventional value. . . . They not only waste so much capital and labour, but direct them from their best use, the production of an adequate supply of cheap food."

[2] Cf. *Lab. Gaz.*, July, 1907, pp. 204, 236.

[3] Lexis, "La Crise Economique de 1907," *Revue des Deux Mondes*, December, 1907, p. 821.

[4] *Economist*, 1907, p. 1223. [5] *Ibid., loc. cit.*

[6] *Ibid.*, p. 1360. [7] *Economist History* of 1908, p. 5.

inent industrial undertakings to show an actual rise in profits and prosperity.[1]

Indeed some confirmation of this point of view is afforded by a study of the whole course in recent years of the comparative movements of the prices of our imports (mainly food and raw materials) and exports (mainly mineral and manufactured goods). Mr. Bowley's table of the quantity of exports given in each year in exchange for a constant quantity of imports shows a maximum in the depression year 1877 and minima in the boom years 1890 and 1900. Similarly a computation from the Board of Trade's report on Exports and Imports at the prices of 1900[2] shows a

[1] The following figures of net profit are significant:—

	1907.	1908.	1909.
Harrod's (year ending Jan. 31) .	£162 517	£172,837	£198,322
Lyons' (year ending Mar. 31) .	£231,849	£248,825	£287,852

Total of shopkeeping companies in *Economist* returns	1907. £1,019,000	1908. £1,048,000

Thus, while most industrial shares fell between September, 1907, and September, 1908, Lipton's rose from 1 7/32 to 1 5/16, Lyons' from 6 to 6 1/16; Harrod's from 4 3/16 to 4 1/2; and those of the River Plate Fresh Meat Co. from 13/16 to 1 1/32.

[2] Cd. 6314, 1912—

	i. Average value net Imports.	ii. Of Exports.	iii. Quantity of Exports given for a given quantity of Imports.
1900 .	100·0	100·0 From	100·0
1901 .	96·7	95·2 which	101·6
1902 .	95·6	90·8 we get	105·3
1903 .	96·9	90·7	106·8
1904 .	97·3	91·8	106·0
1905 .	97·7	91 6	106·7
1906 .	101·8	97·1	104·8
1907 .	106·5	101·9	104·5
1908 .	102·5	98·0	104·6
1909 .	103·6	94·3	110·0
1910 .	109·5	98·4	111·1
1911 .	106·8	99·9	110·0

It should be noted that an unduly unfavourable appearance is given to the whole series by the selection as base of 1900, when the price of our coal exports was abnormal.

It does not of course follow from these figures of relative values that the manufacturing demand is inelastic: but this conclusion is borne out by the Board of Trade figures of *volumes* of exports and imports given in the same publication.

maximum in the depression year 1903, and a minimum in the year of consumptive recovery, 1904.[1] Nevertheless no light is thrown upon the existence of depression in 1886 and 1892–3, nor (most significant of all) upon the undoubted relapse in the second half of 1913[2]: nor is much support

	Volume of net Imports.	Of Exports.
1900 . .	100·0	100·0
1901 . .	102·1	101·1
1902 . .	105·3	107·2
1903 . .	106·2	110·1
1904 . .	107·4	112·5
1905 . .	108·4	123·6
1906 . .	116·6	132·9
1907 . .	113·1	143·6
1908 . .	108·9	132·2
1909 . .	111·9	137·8
1910 . .	114·1	150·3
1911 . .	117·6	156·2

The volume of imports shows a fairly steady rise, owing to changes in the demand schedule occasioned by the growth of population and of the advantages to be gained from international trade: but the much greater growth in the volume of exports can hardly be ascribed entirely to the growth in the import of securities or other "invisible" imports. Nevertheless, in view of our large capital exports in 1905–7, and again during the rubber and oil booms, we must be on our guard against over-estimating the inelasticity of demand.

[1] The general conclusion to which these figures, taken as a whole, lead is that the normal tendency for the ratio of exchange to alter against the manufacturing and in favour of the agricultural communities was in force in the seventies, was suspended in the eighties and nineties, and is now once more on the whole triumphing. This is perhaps the most significant economic fact in the world to-day; and, as has been pointed out to me, the figures tend to under-estimate its gravity, since the rise in the price of exports is in part due to an antecedent rise in the price of raw materials, so that the alteration of the ratio of exchange to the disadvantage of manufacturing *margins* is even more pronounced than the figures indicate. But the fact is clearly of *secular* rather than cyclical importance.

[2] While the prices of the textile materials—wool, jute, and cotton—rose somewhat, the prices of almost all food products—with the important exception of meat—have been falling steadily. The alarming rise in meat prices is due chiefly to the increased consuming power of the world in general and the United States (which has become an importer instead of an exporter) in particular: but also to the aftermath of the 1911 drought and to the increased attractiveness of cereals to the Argentine farmer. Increased sup-

afforded to our previous conclusion about 1908.[1] Both the evidence therefore and the general probabilities of the case force us, while emphasising the supplementary importance of agricultural shortage, to refuse to assign it as the sole cause of industrial collapse.

§ 2 CONSTRUCTIONAL RELAPSE—DEPLETION OF STOCKS.

We are led therefore to investigate the possibility of reaction from the third type of industrial revival discussed in the last chapter, exhibiting itself in a fall of the ratio of exchange of constructional as against consumable goods, and a diminished prosperity of the constructional trades. One possible cause of such reaction at once presents itself. It has been suggested that one result of the increased attractiveness of investment is a considerable absorption into the vortex of exchange of accumulated consumable stocks. After a time therefore, unless and until the consumable goods created by the new instruments appear in sufficient quantities to compensate for this absorption, it will be physically impossible for the investment in construction goods to be maintained on the scale on which it has been begun. The fundamental cause in such circumstances of the collapse of constructional enterprise, is thus seen to be not the high

plies are hoped for in time from Mexico and Siberia, but the period of gestation is some five years (*Times*, June, 1914): and if (as I have been told by a prominent corn-merchant) there are indications that the Argentine farmer is not likely to put under wheat much more pasture land, from which he can raise three crops of fodder per annum, an increased supply from that source will have its drawbacks for food consumers. On the rise in bacon the following comment of a Burnley grocer is suggestive (*Daily Mail*, Dec. 29, 1912). "Years ago I could not sell bacon costing more than 7½*d.* a lb. To-day this quality costs 8*d.* or 9*d.*, but they won't have that now; they want the best, and that costs 1*s.*,"—a criticism which I heard echoed not long since by an observant housewife. But there is also no doubt a genuine shortage.

[1] The dependence of certain branches of English industry on certain groups of agricultural producers might theoretically account for a divergence between English industry as a whole and world industry as a whole: but a cursory acquaintance with the facts shows that this explanation will not help us.

cost of constructional materials,[1] but the scarcity of real capital available for investment.[2]

Considerable evidence can be adduced in support of this proposition, and that not only with regard to the actual months of crisis or turning-point, but also with regard to certain periods which are commonly regarded as times of downright "depression."

(1) The first witness, the condition of stocks, is indeed an unsatisfactory one. Such figures as are available are mainly either of constructional goods or of agricultural products whose supply depends largely upon variations in annual harvests. Nevertheless the information available suggests, for what it is worth, that the boom period is sometimes (notably in 1904–6) marked by a progressive depletion of stocks of consumable goods, and further that

[1] Cf. Part I. chap. iii. § 2.

[2] Those authorities therefore who, following M. Tugan Baranowsky, detect the cause of crises in a shortage of capital seem to be fundamentally in the right. The value of Baranowsky's work is, however, much impaired by his failure to appreciate that the investible capital of a community consists essentially not in money deposits but in its stocks of consumable goods, and his consequent misunderstanding of the real nature of the phenomenon of which he treats (*op. cit.*, Part II. chap. iii.). Thus also Aftalion, who in one place (*op. cit.*, Bk. IV. ch. ii. § 3) makes some suggestive criticism of Baranowsky's theory, treats elsewhere (Bk. XI. ch. iii. § 2) of "fonds de subsistance" or stocks of consumable goods as something quite distinct from "épargnes." For more detailed criticism, cf. review of these two works by the present writer in *Ec. Jour.*, March, 1914.

Among Baranowsky's followers, Spiethoff alone appears to recognise clearly the identity of shortage of capital and shortage of consumable goods. His theory of the "ill-balanced production of industrial equipment and consumable goods" (of which a useful summary is given in Mitchell, *op. cit.*, pp. 10–11) appears to resemble closely that elaborated in the text.

Mr. J. M. Keynes, in an unpublished paper read recently before the London Political Economy Club, develops, especially in regard to its monetary interpretation, the doctrine of the origin of crises in a too rapid absorption of consumable accumulations. To this paper I am much indebted, though Mr. Keynes is, I believe, good enough to acknowledge a reciprocal obligation: and though he is I think mistaken in conveying the impression that the relapse of investment is always due to the physical impossibility of maintaining it upon the existing scale (cf. § 3 below).

this depletion is sometimes (notably in 1901–3) prolonged into the period of depression.[1]

(2) More pregnant is the evidence afforded by the movements of the balance of trade of certain countries upon certain occasions. That the American collapse of 1907 was due not simply to an abuse of the mechanism of credit but to an exceptionally rapid absorption of the real capital of the world[2] is clearly suggested by the following figures of the country's foreign trade.

	Imports.[3] $ m.	Per cent. increase on previous year.	Exports.[3] $ m.	Per cent. increase on previous year.
1904 . .	991		1466	
1905 . .	1117	12·7	1518	4·0
1906 . .	1226	9·8	1743	15·0
1907 . .	1434	16·9	1880	7·9

The tendency for exports to increase at a faster rate than imports was interrupted in 1907 by large capital importations, America having already absorbed her own accumulations.[4] Similarly the increase of the unfavourable trade balance of Canada from 0·6 million dollars in 1902 to 244 million dollars in 1912[5] argues a colossal increase of recent years in that country's imports of capital.[6] While such

[1] Moreover, while statistics of monthly and even of annual production, are lamentably deficient, the general consensus of opinion, supported by such figures as exist, is that the output of consumable goods increases considerably less rapidly than that of constructional goods, affording prima facie ground for supposing that the stocks thereof are at least as rapidly depleted.

[2] "Extravagant consumption had retarded accumulation, while the demand of industry and governments for capital was unabated" (Sprague, *Ec. Jour.*, 1908, p. 355).

[3] The figures are from the *Stat. Abs. U.S.A.*, from which I have calculated the percentage.

[4] M. Leroy-Beaulieu estimates that the capital demanded by America in this year amounted to 16,000 million francs, while the annual savings of the civilised world did not at this time exceed 12,000 million (Levy, *Revue des Deux Mondes*, 1907, p. 812).

[5] *Ec.*, February 15, 1913.

[6] It makes little difference in principle whether the capital imports take the form of consumable goods or of construction goods produced in the lending countries by trenching upon consumable goods.

figures do not of themselves of course afford any evidence that the savings of other countries are unequal to the strain imposed upon them, they do afford some prima facie ground for suspecting that any country which is living thus deliberately and widely outside its income may be involving not only itself but the whole world in a shortage of real capital.[1]

That the shortage of real capital is not always confined to the crisis months is suggested by the course of events in the United States in 1908–10. The renewed attempts at investment in the latter part of 1908[2] were hampered by the scarcity of capital, and in May, 1909, the situation became acute. Its true nature is made more plain than it otherwise might have been by the financial policy of the American railroads. In 1907 they had sought to put off the evil day by the issue of notes or short-term bonds, repayable in two or three years' time.[3] In 1909 some 400 million dollars of these notes became due for conversion, and the situation was met by renewed importations of foreign capital: in June, July and August the balance of trade became unfavourable for the first time since 1897. The situation was temporarily saved,[4] but by the spring of 1910 it again became critical.[5] Again the cure was the same; in February, March and April the balance of trade became unfavourable: "New York has been exporting bonds and raising money in Europe on an unprecedented scale."[6] It was only by swallowing

[1] Cf. some suggestive remarks by Hyndman (*Commercial Crises of the Nineteenth Century*, p. 155) on the temporary nature of an export boom caused by the contraction by a foreign country of a large capital debt.

[2] The metal trades unemployment figure (New York State) fell from 32·3 in May to 18·5 in December: the building figure, however, after an attempted fall, rose 16 per cent. in the period (*vide* Table IX.).

[3] Cf. Levy, *Revue des Deux Mondes*, 1907, p. 812. In the first half of 1907 286 million dollars of these notes were issued at New York by railway companies, of which the Pennsylvania Railroad was responsible for 60 million dollars and the New York Central for 50 million dollars. Cf. Lescure, *op. cit.*, p. 223.

[4] *Vide* constructional unemployment indices in Table IX.

[5] The *Economist's* correspondent (1910, i. 947) speaks truly of "the inflated prices, which are the critical feature of the present situation."

[6] *Ec.*, 1910, i. 824.

copious doses of the physic of foreign consumable goods in 1909–10 that America was able to re-establish herself by 1911 on to a firm basis from which to take her subsequent leap to renewed prosperity.[1]

(3) The evidence afforded by the comparative course of constructional and non-constructional prices is also on occasions suggestive. The rapidity with which in the later stages of the boom the latter gain ground upon the former affords some indication of the extent to which non-constructional stocks have been depleted and of the proximity and severity of the impending crisis.[2] The contrast in this respect between this country and Canada during the last boom is very instructive: cf. the following indices[3]:—

ENGLAND.

	Constructional.	Non-Constructional.		
	Coal and Metals.	Food, etc.	Textiles.	Miscellaneous.
1910	76·6	109·2	136·2	104·3 (1900 =
1911	74·7	111·6	128·9	105·5 100)
1912	84·9	119·9	119·6	110·1

CANADA.

	Constructional.		Non-Constructional.		
	Metals.	Lumber.	Fuel and Lighting.	Hides, Tallow, Leather, Boots.	Food.
1910	97·6	158·5	103·0	135·4	136·2 (average
1911	108·3	165·4	100·5	139·6	137·7 1890–9
1912	117·4	166·5	113·3	152·4	152·7 =100)

[1] Cf. the following figures:—

	Imports. $ m.	Per cent. increase on previous year.	Exports. $ m.	Per cent. increase on previous year.
1909	1311	+ 9·8	1663	−11·2
1910	1556	+18·7	1744	+ 4·9
1911	1527	− 1·9	2049	+11·1

[2] Indeed we reach the somewhat paradoxical conclusion that while in the earlier stages of a boom that country is making the biggest fool of itself in which the divergence is greatest between the rise in constructional and non-constructional prices, in the later stages, when the realisation of error has begun, that country's position is not improbably *soundest* where the divergence is greatest.

[3] *Report on Cost of Living*, Cd. 6955, August, 1913, pp. 308, 386.

The more rapid rise of non-constructional than of constructional prices in 1912 suggests that Canada had made less successful attempts than had England to remedy the relative scarcity of consumable goods. Her enormous capital importations seem to have been used to increase the supply and to keep within bounds the price of constructional materials, instead of in attempting to meet the real danger of the situation. The greater moderation of England in this respect, a moderation which seems to some extent to have deserted her in 1907, and of which she was prevented from reaping the full benefits in 1901–3, has been without doubt a most important factor in mitigating the severity of the recent relapse.

(4) Fourthly, important evidence may be derived from a study of the divergence on certain occasions between the fortunes of different groups of consumptive trades. At a time when the fundamental trouble is a shortage of consumable accumulations, those trades in which the unit of investment is most imperfectly divisible,—the dysenteric trades, as we may call them—are *pro tanto* in a relatively favourable position. For the capacity to produce largely from existing plant is now on the whole an enviable one: moreover, the facilities for investment, which with them is apt to mean over-investment, are severely curtailed. Accordingly we find that in England in 1901–3 these trades, of which wool, boots, ready-made tailoring and hosiery may be taken as representative, were on the whole, to judge from the employment figures, the least severely affected. Thus they showed a marked recovery in the first quarter of 1901, and though from June to September they suffered a relapse, on the whole they seem to have been less hard hit in these years than the more dyspeptic trades such as leather,[1] paper, printing and glass. Glass declined uninterruptedly, paper from April, leather from June: furnishing became worse than the previous year in June and printing in September. It is only in the more dysenteric

[1] Leather, it is true, improved January-June, 1901, but chiefly under the stimulus of the war demand.

trades—with the exception of boots—that employment was fairly well maintained in the second half-year.[1]

Similarly in America during the capital famine of 1908, the unemployment index in the clothing trade fell between May to December from 49·3 to 16·3 or 67 per cent.[2] With the temporary relief of the capital importations, it rose from 11·8 in March to 22·1 in June, from which it only partially recovered in the autumn to relapse again in December to 20·9. With the New Year, as we have seen, the old trouble recurred: building was paralysed, metal hesitative, but the clothing trade began to look up. But with the new dose of capital imports clothing unemployment rose in May by all but 100 per cent. on the March figure, while metal

[1] The causes of unemployment and "depression" in all trades in these years are discussed later in § 4: but it must be premised here that their existence does not disprove the contention that shortage is the fundamental evil. A man, to adopt a famous metaphor employed by Malthus in another connection, is no less confined within a room because he is not actually knocking his head against the walls: and the volume of industrial activity physically possible is none the less undesirably small because the actual volume is still smaller.

Though the American expedient of large capital importations was not open to us in 1902–3 the situation was somewhat relieved by the fact that owing to various circumstances—the great world demand for coal in 1900, the price policy of the coal cartel in that and the following year, and the United States iron spurt in 1902—the ratio of exchange moved in our favour in 1900, and did not move as severely against us in the following years as would otherwise have happened, so that we were to some extent able to obtain the consumable capital we needed, not like America in 1909–10 by the sale of bonds, but by the sale of instrumental capital for which we were not yet ready. But the relief was not considerable, and it was not till 1904 that the slow but steady automatic growth of productivity (cf. ch. i. § 2) had increased the consumable accumulations sufficiently to render possible the investment of the following year.

[2] The recovery of the textile trades in this period is very striking; by June, 1908, "owing to the increased demand for textile goods, there has been a resumption of activity in the New England textile centres. Manufacturers employing from 35,000 to 40,000 persons increased their hours of labour during the latter part of May, and many mills which had been on short time for months started working full time on June 1" (*L. G.*, July, 1908, p. 212).

unemployment touched 2·9, the lowest point yet reached in the period.[1]

(5) Finally, while adhering to our decision to postpone the discussion of purely monetary influences, we are justified in turning for corroboration of our conclusion to the explanation sometimes given in monetary circles of the cause of crisis. There is some evidence that at such times it is not only the extent but the nature of the transactions in which they are involved that causes disquietude to the powers of the money market. It seems indeed impossible to determine in what proportions the resources over which the control is dispensed by the banks are being devoted at any given time to the furtherance respectively of constructional and consumptive enterprise. The external similarity between the trade and the finance bill would be an insuperable obstacle to the investigator; nor does the character of the collateral deposited against a loan necessarily throw any light upon the use to which that loan is being put. But the phrase frequently heard at such times in explanation of the scarcity of "money" for purposes of company flotation, that the "needs of commerce are so great that there are no further funds available for industry," seems to throw some light on the true situation. At first sight it would seem that an abundant supply of genuine trade bills, in other words a large volume of current consumptive trade, is precisely the condition most favourable for a recrudescence of industrial investment and constructional enterpeise. But beneath and behind its monetary veil the phrase appears to imply a realisation on the part both of the creators of currency and of the producers and purveyors of consumptive goods that the supply of consumptive goods is in arrear of the requirements of those already embarked upon

[1] The metal figures 1910–12, however, indicate that mere abundance of capital is not sufficient in America to cause a sustained recovery in investment, if agricultural influences are absent. The more "luxurious" consumptive trades, notably printing, reaped most of the benefit. (There seems, however, to have been a temporary recovery—not entirely seasonal—in building in the summer of 1910.)

constructional enterprise, and that the most profitable use of increased resources derived from successful trade will be in eliciting the production not of more construction but of more consumption goods. This realisation of the true situation is indeed more or less inextricably mixed in the minds of bankers, etc., with the conviction that their gold reserves are small compared with their total liabilities, and also that the resources already devoted by them to investment are so far from liquid that the more tightly they hang on to those gold reserves the better ; and this aspect of the situation is perhaps the dominant one in their minds. But there seems justification for suspecting also at least a subconscious recognition that a mere increase in gold reserves would not permanently solve the essential difficulties of the position.

It remains to point out certain factors which aggravate this tendency to a progressive depletion of consumable stocks. The first is the length of the period of gestation in the principal trades, with its double consequence of the absorption of an unwarrantably large proportion of existing resources in investment, and of delay in the production of new consumable goods. The matter has been so thoroughly discussed in the first part that no more need be said of it here.

The second aggravation arises from the fact that the invested resources are not as a rule equally distributed among all industries : in fact, for various reasons elsewhere discussed, an exceptionally large proportion is absorbed in investment in the industries of transport, which are not engaged in the production of " goods," in the ordinary sense, at all. When a large quantity of assorted goods is invested in one form or other of railway building, no automatic provision is thereby made for their replacement, and a shortage not only acute but prolonged may be expected to ensue. For instance, there is a good deal of disagreement between two authorities so much alike in their general conclusions as Mr. Hull and M. Lescure as to whether " depression " existed in the United States in 1900–1. The

ambiguity disappears when we remember the abnormally large part played by investment in the transport industries, especially in electric traction, in the preceding boom, so that the ill effects of the over-investment were naturally enough not felt severely in the form of that "general over-production" of consumable goods which is M. Lescure's only criterion of a depression. But that depression, in the essential sense of a generally curtailed consumption, was prevalent there seems no reason to doubt.

Thirdly, the pressure on the world's supplies of real capital may be reinforced by exceptional circumstances. Thus it seems clear that the crisis of 1900 in England and the subsequent depression of the "consumptive scarcity" type was aggravated by the absorption, both by taxation and by Government borrowing, of large quantities of consumable goods into (industrially) unproductive channels for purposes of the South African War. Similarly the crash of 1907 was aggravated by the large toll which had been taken from the world's real capital in the early stages of the boom by the Russo-Japanese War and by a series of disasters of which the most conspicuous was the San Francisco earthquake and fire. Mars and Vulcan had each contracted a sterile union with Juno Moneta and the real "overproduction" of the early twentieth century was an overproduction of flames and hatred.[1] And while those

[1] In this connection the figures of capital issues on the London markets are significant: though, as Mr. Layton has pointed out, these figures must be treated with caution, as they (1) only represent capital *publicly* subscribed, (2) include issues floated in London but ultimately held in part abroad.

	British, Foreign and Colonial Governments.	Total.
1898	£34,236,400	£150,173,000
1899*	17,298,600	153,169,000
1900*	56,178,200	165,499,000
1901*	91,264,400	159,358,000
1902*	67,143,900	153,812,000
1903	43,960,000	105,463,000
1904†	63,771,200	123,020,000
1905†	61,508,000	167,187,000
1906	35,728,100	120,173,780
1907	36,397,200	123,630,000

* S. African War. † Russo-Japanese War.

writers who, like Mr. F. W. Hirst,[1] find in the Balkan War and the enormous war-loans and armament bills of the Great Powers the sole and sufficient cause of the ebb of the recent trade boom, lay themselves fairly open to the charge of monomania, there need be no question that they have a considerable measure of right on their side.

§ 3. CONSTRUCTIONAL RELAPSE—ESSENTIAL CAUSES.

It must not, however, be supposed that a check to the type of industrial revival depicted in ch. i. § 5 can only be caused by an actual depletion of the stocks of consumable goods. In the first place it is possible that in certain periods of expansion (as perhaps in England in those culminating in 1882 and 1890) the growth of general productivity is so considerable that no such depletion actually occurs; secondly, in normal cases the close of the period of gestation will bring replenishment. Nevertheless, neither in the first case is constructional relapse avoided, nor in the second case is constructional activity immediately restored. The check to investment arises from the recognition not necessarily that to maintain it upon the same or an increased scale would be physically impossible, but that it would involve a sacrifice of present enjoyment disproportionate to the result. Consumable goods may be abundant, but if it is known that with the close of the period of gestation they are about to become far more abundant still, a wise community will devote them to eliciting the immediate production of other consumable rather than of constructional goods. The fundamental meaning of over-investment is failure to attain the ideal distribution of the community's income of consumable goods through time. Although therefore a country may be actually increasing both its current consumption and even its accumulation of consumable goods, it may still be engaged in over-investment.

[1] Cf. *Economist*, 1912–14, *passim*.

That the most conspicuous relapses of constructional industry are not always due to a positive shortage of real capital is proved by the manner in which the spirit of investment often flits from trade to trade and country to country before receiving its final quietus. The apparently most general collapse is often seen to be not quite general after all. Thus in the seventies investment, repulsed from construction and transport, continued to flow into the woollen trade. The productive capacity continued to increase right up till 1875, which (in view of the shortness of the period of gestation) indicates a continued investment after the closing of more obvious fields.[1] Similarly in 1883, 1890, and 1900–1 investment seems to have continued on a considerable scale in the cotton trade[2] after it had deserted constructional industry. The building trade again appears sometimes to serve as a kind of resting-place for homeless resources. "Probably owing to the uncertainty of adequate returns in other channels of investment," says the *Leeds Mercury*, reviewing the course of 1876, "spare capital has to a large extent been employed, with assurance of substantial results, in the building or purchase of property. On the principle that it is an ill wind which blows nobody good the building trades have actually reached some advantage from the comparative quietness of other branches of business. . . . All classes appear ready to invest in house property."[3]

In precisely the same way certain countries, of which the Argentine Republic is the most conspicuous example, seem to fulfil the function of a kind of sink for investible

[1] The *Leeds Mercury* estimates that between 1871 and 1875 the number of spindles had risen in the woollen branch from 2,664,979 to 3,766,703, and in the worsted branch from 1,881,144 to 2,182,792.

[2] Cf. p. 21.

[3] Similarly a large continuous rise in house-building projects took place in the first half of 1910 (see table), when the price of pig-iron was falling: and the building trade has done very well in the first part of 1914. Indeed, after the main constructional relapse of 1913, there seems to have been a considerable flow of capital, not only into house building but into general manufacturing enterprise. Cf. the following figures of London capital applications :—

resources when more familiar channels are already well filled.[1] It will be remembered that the maxima of our constructional exports to the Argentine occurred in 1884, 1889, 1896, 1901, 1904, and 1909,—years of which all but the second are commonly looked upon from an English point of view as years of ebb or at best of hardly perceptible advance. The history of 1909–11 in particular suggests that the Argentine is apt to be used as a kind of reservoir of investment, when other fields have been temporarily flooded, and to be deserted again on the discovery of a new toy such as rubber or oil.[2]

The check to constructional activity, whether catastrophic or piecemeal, does not, however, necessarily imply that there has been any miscalculation. If the initial impulse to investment is either some new invention or a discontinuous leap in general prosperity such as the opening up of a new market or country, it may in any case, even in the

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	1912.	1913.
Iron and Steel Companies . . .	£8·8 m.	£6·4 m.
General Manufacturing Companies . .	8·5	10·9

	1912.	First quarter of 1913.	1914.
Manufacturing	£2·3 m.	£4·9 m.	£4·2 m.
Electrical	1·6	1·8	4·3
Total	48·0	50·3	97·6

[1] Cf. the manner in which, after the relapse of the American railway-building boom of 1869–71, the German capital by which it had been largely supported was absorbed in constructional investment at home.

[2] It should be observed, however, that while the migration of investment from trade to trade eases the industrial situation, its migration from construction and transport in one country to construction and transport in another tends, while affording temporary relief to the industries in question, to aggravate the essential danger. The increased opportunities for such migration, to be illustrated perhaps in the next year or two by the substitution of Rhodesia and British East Africa for Canada and South Africa as sinks for British capital, may tend in the future both to prolong the length of the typical constructional boom and to aggravate the ultimate reaction. In this as in other cases the action of the law of compensatory demand is not, while other disturbing influences remain, unequivocally beneficial.

absence of all miscalculation, only be of a temporary nature. Once the new instruments are constructed they will be capable for a long time of satisfying all demands [1]: the activity of constructional industry is necessary as a preliminary stage to the prolonged prosperity of industry in general, but constructional industry itself cannot expect to share in that prosperity. The fate of Forerunners is proverbial.

In this connection the differences between the various inventions which seem to be mainly responsible for the fluctuations in modern German industry are of considerable interest. The "invention" which precipitated the great boom of 1873 was none other than the invention of modern Germany itself,—a sudden anticipated leap in the whole conditions of national prosperity and demand.[2] Hence the course of constructional industry was one of dramatic expansion and collapse. The invention of the late seventies on the other hand was an improvement of processes within the iron and steel industries themselves,—equivalent to a permanent lowering of their costs of production and not to a temporary increase in the demand for their services: and the reaction consequently was very slight.[3]

The invention of electric power did not, like that of Germany, amount to a general raising of consumers' demand; but neither was it in the main, like that of basic

[1] Compare the manner in which, according to a remark made in my presence by a manufacturer of agricultural machinery, the passage of Captain Pretyman's bill enforcing the fencing of the dangerous parts of such machinery led to a boom in the trade for some months, followed by a period of slackness. So also with the more durable kinds of consumptive goods: thus the recovery of Indian agricultural prosperity in 1910 led to a sudden boom in copper imports for braziers, followed by a slump (cf. *R. of I. T.*, 1911–12, p. 19).

[2] It was, moreover, accompanied by peculiarly aggravating circumstances, among others the natural propensity of the human mind to expect too much in the way of economic advance from military success and political readjustment.

[3] Indeed the production of coal sustained a continuous rise throughout the decade, and that of pig-iron fell only in 1886: but the production of steel fell off somewhat after 1882.

steel, a cheapening of the costs of *constructional* production. It involved a permanent lowering of the cost of production of *finished* goods and services, a permanent increase therefore in the volume thereof produced, but only a temporary elevation of demand for the instrumental goods required to produce them. Consequently reaction in the constructional industries was comparatively prolonged and severe. Here, however, a new distinction must be drawn. The first wave of electrical development consisted chiefly in the electrification of the means of transport and illumination, which must be supplied at once upon the largest possible scale.[1] Hence the progress of investment was particularly discontinuous, and the reaction on constructional industry particularly severe. But in the new century electrical power was more systematically applied to miscellaneous manufacture,[2]—a proceeding which involves not the whole-

[1] In England, says the *Economist History* of 1895, "electric lighting and transmission have been greatly developed during the past year; the various systems have passed the experimental stage, and trustworthy data are available in regard to cost and efficiency. Transmission of power up to twenty miles can now be depended on." The great companies undertaking the supply of electric light in the metropolitan area were mostly established by 1897, and in 1896 the principle of electric traction, hitherto used only in mines, was employed in the new tube railways. The much slower progress of *general* electrical engineering is indicated by the following figures, quoted by the *Economist* (1898, p. 1489) from Garcke's *Manual of Electrical Undertakings* :—

Capital invested in	1896.	1897.	1898.
Electric Traction . .	£6,084,672	£8,553,173	£14,406,140
Electric Supply Cos. .	5,831,073	6,647,792	8,407,628
Municipal Electric Supply Companies . .	1,967,000	3,509,317	5,734,938
Electric Manufacturing Companies . .	6,596,244	8,519,430	10,535,937

In America the abortive boom of 1895 seems to have been largely due to the substitution of copper for iron wires in the existing telegraph and telephone plant of the country (Lewis, *Circular* of 1896)—a process which would neither be very prolonged nor need repetition.

[2] In support of this statement it may be noted that the chief demands on German industry in 1905 were no longer for transport but for hoisting, pumping, etc., in iron and coal works (*Ec.*, 1906, p. 501): that while the number of workmen employed in the two great manufacturing trusts of Berlin rose by 10 or 11 per cent.

sale application once for all of one great invention, but an infinite variety of miscellaneous separate inventions applicable to various trades. "Inventions in one country"—and in one industry—"serve as a basis for new advances in another," [1] and the whole process is diffused and prolonged: the constructive does not march so far ahead of the operative stage of industry. Consequently the industries of electrical construction suffered but little in the depression of 1907–9.[2]

in 1905 on 1904, the number employed in "small electrical concerns engaged in manufacturing one or more special articles" rose about 20 per cent. (*ibid.*); and that the building boom in 1906–7, says the *Economist* (I have been unable to verify the reference, and cannot be certain of the statement), was even more a boom in factory construction, such as would naturally be generated by the prospect of cheaper power, than a boom in domestic construction, such as would naturally follow a cheapening of transport. For an interesting account of the application of electricity to the textile, coal-mining, steel, glass, flour and other industries of Lancashire, see *Times*, Engineering Supplement of July 9, 1913, p. 9.

[1] Lewis, *Circular* of 1905.

[2] In 1907 the copper consumption of England, Germany and France suffered but little diminution, while that of Italy and Austria increased. In 1908 the consumption of England rose by 1,700 and of Germany by as much as 37,000 tons, while that of France, Italy, Austria and Russia also increased. The survival was more marked in Germany (where the conditions relevant to invention are always of supreme importance) than in England. In England in 1908 "electrical machinery and equipment makers were complaining of the insufficiency of employment": and in 1909, while the copper consumption of Germany rose by 4,000 tons, that of England fell by 11,000 tons. In America, the copper industry seems to have been still more at the mercy of the discontinuous type of demand. Consumption fell by 61,000 tons in 1907 and 33,000 tons in 1908; and in the latter half of 1909 we still find the *Engineering and Mining Journal* complaining that "telephone, lighting and power, etc., have already been exploited, and the cream has been skimmed off hydro-electrical development" (*Ec.*, 1909, ii. 335), and that there seem no new worlds to conquer. It was only the cereal conditions of that autumn that re-established the flow of investment.

Even in Germany the copper industry was unable to rescue from depression its iron and steel colleagues. For while its influence upon them had been less intense than in the 1900 boom (cf. p. 159) it had also been less warrantable: the iron and steel used for the factories, steel works, etc., built in 1905–7 only *expected* to require the co-operation of copper instead of being physically united with it, and the check to comparative over-investment was correspondingly small.

The most recent phase of electrical development—the electrification of ordinary railroads—must be expected to be less continuous in its course, and to involve more serious constructional relapses. Thus, while in Germany in 1911–12 " with the growing application of electrical force to railways, the electro-technical industry has received another impetus," [1] it has not been able to retain its position in more recent months ; and the drop of some 6,000 tons in English copper consumption in 1912 and again in 1913 is perhaps to be connected with the conclusion of the first wave of non-metropolitan railway electrification, in which Newcastle and Liverpool took the lead.[2]

It is clear then that we must be on our guard against condemning as over-investment what is really only unavoidable preliminary investment upon an exceptionally large scale. We must be careful not to blame the Swiss Family Robinson for sitting down to make bows and arrows instead of catching the cassowary—a swift-footed bird—by putting salt upon its tail. The period of gestation cannot be shortened except at the cost of a miscarriage. At the same time there seems little reason to suppose that the process of investment is ever actually checked at the ideal moment. It seems clear, to return to the island metaphor, that as a rule the happiness of the family through time could be increased if some of them, instead of making bows and arrows, were to pursue the eggs or the young of the cassowary, which can be caught with the hand, or even to dance and sing for the edification of the rest. But they are

[1] *Ec.*, 1912, ii. 233.

[2] Similarly the developments in America in 1909–10, of which the most notable were the electrification of the New York and Chicago terminal sections of the Pennsylvania and Illinois Railways respectively (*Ec.*, 1910, i. 11), were followed by a drop of 35,000 tons in copper consumption in 1911. There was a revival in 1912, but a decrease in 1913 variously estimated at 23,000 and 40,000 tons.

It seems reasonable to suppose that (since it is the vehicle and not the permanent way that is in question) the " oilification " of the world's mercantile marine is likely to be less discontinuous and so to involve smaller fluctuations of constructional industry than the electrification of railroads.

obsessed by the danger of being unarmed: they keep the extent of their preparations dark from one another; and they forget that (especially if they enjoy the advantage of electric light) one bow and set of arrows can be made to go further if they work in shifts than if they all want to use them at once. Further, there is a tendency among them to suppose that their existing bow and arrows, with which they have been accustomed to shoot cassowaries in Cocoanut Grove, will be ineffective now that the herd has migrated to Silver Creek. Finally, as a matter of fact, a number of the family are not engaged in making bows and arrows at all, but in constructing an island railway capable of transporting the corpses of a hundred hypothetical cassowaries yet unhatched.

§ 4. THE SURVIVAL OF CONSUMPTION.

The main conclusions of the last two sections may be summarised as follows. First, the relapse in constructional industry is seen to be due to the existence or imminence of an over-production of instrumental as compared with consumable goods. Whether or not this over-production is indicated by an actual shortage of consumable goods which renders it impossible to maintain investment on the scale which has prevailed during the preceding years or months, and whether it is due to miscalculation or to the inevitable characteristics of modern large scale production, its essential nature is the same,—a failure to secure the best conceivable distribution through time of the community's consumption of consumable goods. The aggregate satisfaction of the community over time is thereby diminished, and the damage to that extent final and irremediable.

But secondly, so far as our argument yet goes, there is no reason for the consumptive trades as a whole to be adversely affected by the constructional collapse. The constructional boom was only the necessary preliminary stage; to minimise the damage caused by over-investment, all that is needed is for the consumptive trades to produce

upon the largest scale for one another's consumption.[1] The classical objection to the possibility of a "general over-production,"—the objection that since the various products will form a market for one another there is no sort of necessity for a general accumulation of stocks or restriction of output, seems so far to be substantially valid.[2]

[1] This argument appears to me untouched by current statements of the doctrine of "repercussion" (cf. Lescure, *passim*). It is true that the trades particularly dependent for a market on constructional producers will be temporarily affected: but no reason is given why the distress should be either general or permanent.

Even Dr. Marshall's mode of expression seems to me to darken counsel: "In short," he says (*Principles*, p. 711), "there is but little occupation in any of the trades which make fixed capital. Those whose skill and capital is specialised in these trades are earning little, and therefore buying little of the produce of other trades," —a remark which is undoubtedly true as far as it goes, but throws little light upon the difficulty.

[2] This proposition is denied, on apparently inadequate grounds, by M. Aftalion. "Il n'est pas certes trop de produits dans le sens qu'ils dépassent les capacités matérielles de la consommation, ou qu'ils excèdent la puissance de nos désirs." Nor is there necessarily any alteration in their mutual values in exchange; "toutes les marchandises achèteront bien autant d'autres marchandises qu'auparavant. Leur valeur d'échange aux unes et aux autres ne sera peut-être modifiée" (*Journal d'Economie Politique*, 1908, p. 702). But there is nevertheless a genuine condition of general over-production due to a general lowering of marginal utilities. "Par excès des biens relativement aux besoins, on entend simplement que pour nombre de marchandises diminue l'intensité des derniers besoins satisfaits, par suite aussi l'utilité finale" (*Les Crises Périodiques*, ii. 277).

The fallacy of the argument as it stands is obvious: there seems at first sight no sort of reason why I should be depressed if the marginal utilities of all commodities I possess are lowered provided their total utilities are increased, and provided there is no alteration in the ratio of exchange against my own particular products. It is true that M. Aftalion subsequently makes the much more fruitful suggestion discussed in the next section; but it appears to be added somewhat as an afterthought, and throughout his whole discussion he constantly succumbs almost without a struggle to the natural tendency of Man the Producer to regard abundance as in itself an evil. It is without any sense of paradox that (e.g., in vol. ii. pp. 182–3) he speaks of a time in which people have got less than they want as a time of prosperity, and vice versa, or makes use of an unfortunate series of metaphors in which the flow of commodities is compared successively to a swarm of malignant microbes and to the flow of calories by which a room is "fatally overheated."

And indeed it seems to the present writer that there is strong and abundant evidence that such a survival of consumptive over constructional industry is a normal occurrence,—that constructional relapse and the close of the period of gestation tend, as we should expect, to be followed by an increase in the mutual consumption of each other's products by consumptive producers. This important phenomenon has been much obscured, owing partly to the popular habit of regarding high money prices as the sole criterion of prosperity, partly to the unsatisfactory character of most of the available indices of unemployment, in which constructional industry is greatly over-represented. In support of this proposition it will perhaps be sufficient to call three witnesses,—coal, wool and the consumption of various kinds of food.

A first glance at the curves of production and price of pig-iron and coal shows so marked a correspondence between them that it is not uncommon to assume that the relation that exists is of a very simple nature. Coal is one of the two principal materials required for the production of pig-iron; hence an increased prosperity or depression of pig-iron leads naturally and immediately to an increased prosperity or depression of coal. If, however, we go behind the broad annual figures and examine the actual order of events, this conclusion can no longer be maintained.

In the first of the boom periods under review, the connection does indeed appear to be of this simple kind. The immense rise in the price of the two products took place almost simultaneously in the latter half of 1871, and was supported throughout 1872 by the German industrial boom and the increased activity of home shipbuilding. Iron prices declined on the whole after June, 1873, the price of coal having broken in February, that is to say, shortly after the first symptoms of restriction of pig-iron production became apparent towards the end of 1872. It would seem that the prosperity of coal was at this time mainly dependent on the demands of the iron industry.[1]

[1] Some contemporary observers were inclined to attribute the

In subsequent periods, however, there has been a marked tendency for the prosperity of coal to be independent of that of iron, and to depend for its continuance upon the demands of the transport and consumptive trades.[1] Thus,

excessive advance in the price of coal to the increase of steam at the expense of sailing tonnage which was brought about by the opening of the Suez canal in 1869. There can be no question that there was such an increase, nor that a reaction in favour of sailing ships synchronised with the low coal prices of 1874–6. Cf. the following figures of new tonnage (1st Financial Blue Book, Cd. 1761 of 1903, p. 379):—

	Sailing.	Steam.
1868	246,358	115,970
1869	242,562	145,530
1870	126,461	267,896
1871	60,260	330,798
1872	58,757	415,961
1873	89,626	363,917
1874	189,094	414,773
1875	245,357	226,701
1876	241,088	136,932

Nevertheless, certain facts appear to tell strongly in favour of the view adopted in the text. In the first place the large output of steam tonnage in 1874 was quite unable to repair the break in coal prices. Secondly, the Select Committee of 1873 found that of the increase of 19½ million tons in the consumption of coal in 1873 over that in 1867 (123½ million as against 104 million tons), 6½ million tons was used by the blast furnaces, 10 million tons in other kinds of iron manufacture, and only 2½ million tons for export and 1 million for bunkers (quoted by D. A. Thomas in *Stat. Jour.*, 1903, p. 485).

[1] The change was very marked during the seventies and early eighties. On the one hand iron had been abandoned as the material of rails in favour of steel, whose production required only one-fourth as much coal per ton (*Times*, Jan. 1, 1878). On the other steam had finally established its victory over sail at sea, and in the vast new tonnage of 1881–3 steam vessels so largely predominated that the effect of their demand upon the price of coal was very considerable.

	Total.	Steam.
1880	472,896	414,831
1881	608,878	515,110
1882	733,051	635,212
1883	892,216	744,126

(In this period, however, as in the last, and again in 1890–2, high coal prices seem to have started a reaction in favour of sailing ships.)

Moreover, there has been a continuous progress in economy of coal in the production of pig-iron. Thus:—

while iron prices began to decline from January, 1880, coal prices remained depressed till 1882, rose slightly in that and more in the following year, and were fairly well maintained in 1884 when iron was slumping. Again in 1900 the first shock to iron came with the cut in American wire prices in April, while coal prices remained intact till October, and throughout 1901 the reports of the trade continued cheerful. Again in 1907 coal continued to boom when the

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In 1830 7 tons of coal were used per ton of pig-iron.
In 1866 3 tons 7 cwt. of coal were used per ton of pig-iron. (Price-Williams, *loc. cit.*)
In 1881 2 tons 3 cwt. of coal were used per ton of pig-iron.
In 1888 2 tons 0·4 cwt. of coal were used per ton of pig-iron. (Chisholm, *loc. cit.*).
In 1901 1 ton 12 cwt. of coal were used per ton of pig-iron. (Jeans, *English Iron Industry*, pp. 18, 45.)

Mr. Price-Williams estimates that whereas of the coal consumption of 1869 15·21 per cent. was used in the manufacture of pig-iron, 15·00 per cent. in other kinds of iron and steel manufacture, 3·05 per cent. in steam navigation and 9·10 per cent. for export, of the consumption in 1887 only 9·44 per cent. was used in the blast furnaces and 7·02 per cent. in other kinds of iron and steel manufactures, while 8·48 per cent. was consumed in steam navigation and 15·09 per cent. exported (*Statistical Journal*, 1889, p. 38). This estimate, however, is arrived at by attributing the same percentage of consumption (23·58 per cent.) to general home manufactures in both years ; and in view of the improvement of processes it seems likely that there should have been some reduction in the latter year. Mr. Chisholm's estimate of the consumption of the various iron and steel industries at 33⅓ per cent. in 1869 and 20 per cent. in 1887 is perhaps therefore nearer the mark (*Statistical Journal*, 1890, p. 567). In the same sense Mr. D. A. Thomas compares the conclusion of the 1873 Committee cited above with his own estimate that of the increased consumption of 1900 over 1895 (225 million tons against 190 million tons) 15½ million tons is to be credited to the demands of navigation and export, and only 3½ million tons to the blast furnaces (*Statistical Journal*, 1903, p. 485).

At the present time the proportion of the yearly product exported is even greater (in 1913 it was no less than 36 per cent.), nor is it to be inferred that the coal exported is any more dependent on the demand of the iron and steel industries than that which remains at home. Of our exports in January to March, 1903, according to Mr. Thomas, 82 per cent. was steam coal, mainly for use in navigation, while only 3·5 per cent. was in the form of coke suitable for steel manufacture (*Statistical Journal*).

price of iron broke in March,[1] and was still rising in September; for the demands of the world's enormous merchant fleets were undiminished,[2] and even in November it was only a "gentle decline"[3] in coal prices that set in. Similarly in 1913–14, not only has the export trade in coal been abnormally prosperous, but the inland trade also appears to have "maintained its position."

The evidence of Great Britain is confirmed by that of the United States. There the maximum of bituminous coal prices has generally been attained the year after that of pig-iron prices, to wit in 1874,[4] 1881,[5] 1888, 1891, 1896, 1903. There is also a maximum in 1893, the year after the maximum of constructional activity as indicated by pig-iron production though not by price; and a substantial rise in 1901, when pig-iron prices fell away.[6]

In Germany, on the other hand, the coal industry seems in its natural state to be bound more closely to the wheels of iron. In the Saar district, for instance, in 1899 it was estimated that 28·04 per cent. of the total product was consumed by the various iron industries,[7] and in the Ruhr district the proportion was said to be still higher.[8]

[1] *Economist*, 1907, pp. 187, 192. [2] *Ibid.*, p. 1535.
[3] *Ec. H.* of 1907.
[4] In this case two years. For the figures and their sources see Chart II. The figures for 1902–3 are of course largely affected by the great Pennsylvania strike. I have taken the bituminous index, as throwing more light on industrial conditions than that for bituminous and the domestically consumed anthracite combined.
[5] In France in the early eighties the consumption of coal survived that of pig-iron by two years (de Foville, *Economic Meteorology*, *Jour. Stat. Soc. of Paris*, 1888).
[6] In 1907 also there was still in October a "rising demand for coal," long after the constructional slump had begun (*Economist*, 1907, p. 1360). One of the most remarkable features of the curve is its flatness compared with that of pig-iron during the 1907 boom, which furnishes additional evidence of the comparatively slight extent of the direct dependence of coal on the iron industry. The 1907 iron boom was largely a matter of electric transport and of structural steel for building purposes, neither of which lead to any very considerable subsequent demand for coal. *Coke* prices, however, rose considerably under the influence of steel.
[7] F. Walker, *Monopolistic Combinations in the German Coal Industry*, p. 12. [8] *Ibid.*, p. 231.

It is true that while the price of iron broke in 1873, that of coal continued to rise in 1874 [1]: but in 1883 and 1890 there are no appreciable signs of similar independence. The remarkable maintenance of coal prices at the expense of iron in 1900–1 must therefore be ascribed mainly to cartel action.[2] Yet even so it is noteworthy that while the Ruhr Syndicate's base price of coking coal, which is most directly dependent on the iron industry, rose by 50 per cent. in the iron "essor" of 1897–1900, and fell by 5 per cent. in the following year, that (e.g.) for gas coal rose only 16 per cent. in the same period, and was maintained in 1901 at the 1900 figure.[3] Again, though the Coke Syndicate was able, by means of its "two-year fusion price" determined in 1899, to maintain the price of coke throughout 1901, the fiscal mines of the Saar were forced to submit to a reduction of average proceeds per ton of coke from 20·73 m. in 1900 to 20·36 in 1901, while they raised the price of "greasy coal" (Fettkohle) from 11·4 m. to 12·5 m.[4] Thus even in Germany we can detect traces of a natural independence of coal, as opposed to coke, of the demands of the iron industry.

The conclusion then is that the demand for coal is generally maintained for an appreciable time after a constructional collapse by the continued prosperity of the consumptive trades.[5] We must indeed be on our guard against

[1] When Ruhr Förderkohle on the Essen Börse reached the long unbroken record of 15·80 m. (*ibid.*, p. 180).

[2] Indeed the tyranny of iron may be regarded as one of the chief causes of combination in the German coal trade. Germany more even than any other modern nation has won her way to industrial pre-eminence through the power of iron, and her coal producers have neither the vast railway mileage of America nor the vast mercantile fleet of Great Britain to fall back upon.

[3] *Vide* figures quoted by Walker (*op. cit.*, p. 182).

[4] *Ibid.*, pp. 187, 197. Similarly in Upper Silesia the fiscal mines made heavy reductions in the price of coking coal, but advances in the price of other kinds in 1901 (*ibid.*, pp. 186, 189).

[5] Cf. the manner in which, within the constructional trades themselves, the maximum of brick prices in the United States is reached sooner (1886, 1898, 1901, 1906) than that of iron prices (cf. Chart II.): the construction of brick buildings is even more obviously a preliminary and transitory stage than is that of iron

misinterpreting the evidence in certain cases. In the first place, as in England in 1900, the high price of coal may be due to exceptional causes such as war,[1] and be an actual source of embarrassment not only to constructional but also to consumptive industry.[2] Secondly, a large volume of railway and shipping traffic, which are among the principal causes of a high demand for coal,[3] do not always indicate genuine prosperity, but sometimes a large temporary transport of goods for forced sales, which cannot be expected to continue, and which is contemporary with a restriction of output.[4] Finally, we have seen in discussing the shipping trade that the operation of a large quantity of tonnage by

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and steel goods, and the iron trade discards brick—kicking away the ladder upon which it rose—in precisely the same way as it is itself discarded by trade in general at a slightly later date.

[1] General manufacturing industry gave poor support to the coal trade in 1900: cf. *Ec.*, 1900, p. 1533, which attributes special importance to the slackening of demand from the cotton trade.

[2] In Germany also complaints were heard from miscellaneous industry, but in Mr. Walker's opinion they were not well founded except possibly in the case of cement and lime (*op. cit.*, p. 244).

[3] In 1890 in particular (apart from an increase of 1 m. tons in the exports to France) the prosperity of home railways, whose goods traffics receipt increased by about 4·8 per cent., seems to have been the most important factor in sustaining the demand for coal. It should be noted that on this occasion the survival over constructional industry was more prolonged than might appear from the pig-iron figures, for the price of pig-iron was unnaturally sustained by the Scottish strike: the prices of finished iron began to drop considerably earlier.

[4] With the transport industries in this connection must be classed the enveloping trades. Thus the prosperity of our tin-plate trade in late 1907 and 1908 was due partly indeed to an increased demand from Norway, Rumania and Japan, but partly to the enormous liquidatory exports of the United States. The jute trade might have been expected to share in this prosperity, but there had been too much speculation: "As an instance of the state of the burlap stock of New York it may be mentioned that the warehouse accommodation was taxed to the uttermost, and thousands of bales for which room could not be found had to be sent to Brooklyn" (*Ec. H.* of 1908), and demand was cut off "as with a knife." The jute trade has been doing remarkably well in recent months: and the depression in tinplates in 1913 must be attributed entirely to excessive investment, demand, especially from the United States and Canada, having been exceptionally active.

no means always implies a large volume of sea-borne trade. Nevertheless, the evidence seems to be important so far as it goes.

The next witness is the woollen trade. We have already had occasion, in connection with the course of wheat prices, to point out its frequent survivals over the collapse of constructional industry. Here it must be added that there are signs of the same tendency even when the price of wheat affords no assistance. The trade, for instance, remained good throughout 1891; and in 1908, though it suffered to some extent from the depression, in particular, of its shipbuilding clients and from the disputes in the cotton [1] and engineering trades, it was by no means plunged in unmitigated gloom. "Fairly good," "quiet" and "moderate" are the worst the *Labour Gazette* has to say of employment in this year: and by October we hear of "the improved appearance of factories" and learn that "there are signs of wholesale buyers being more disposed to consider the placing of orders on a more liberal scale," that "quite as many patterens have been taken up as in past years, and if that is anything to go by, an average trade should be done," and that "throughout the woollen area a fairly hopeful feeling over the future prevails." [2] Similarly in the following March we learn that on the whole the "time worked and the output of goods have been on a liberal scale," that in the Dewsbury and Batley district there has been a "fair amount of prosperity," and at Huddersfield "the business done, though disappointing in some respects, has not all round been unsatisfactory"; while at Leeds, "some factories have not shown the least sign of depression

[1] For though the two industries are undoubtedly to some extent rivals, yet the effect of a dislocation of this kind in upsetting general business confidence in the neighbouring county seems to be more immediate and important than the effect in diverting demand, at any rate when, as in this case, the dislocated industry is suffering from glut. Moreover the wool industry is affected injuriously by a shortage of cotton warps.

[2] *Economist*, 1908, ii. 751.

during the past year." [1] Throughout 1909 the wool business was "sound, with almost entire absence of speculation"—a fact which is all the more remarkable in view of the wheat shortage, which brought the Gazette average for 1909 up to 36*s.* 11*d.*

Similarly it is worth recording that in 1908 "the boot and shoe trades were very well employed throughout the year," and during 1909 trade was active, and manufacturers "have obtained an advance and are well supplied with orders."

The last witness is the consumption of various kinds of food-stuffs, as revealed by the index already discussed in Book I. ch. vii. § 3. A reference to the curve will show that it tends to survive the fortunes of construction, and even sometimes of the wool industry, reaching maxima in 1876, 1885, 1891 and 1901.[2] Similarly in the United States there are clear traces of food consumption surviving construction in the fiscal years 1891, 1901, 1904–5 and 1910 [3]: though in that country the dependence of both kinds of activity on the prosperity of cereal producers tends to obscure the issue.

It should be observed that in both countries the consump-

[1] *Economist*, 1908, ii. 751.

[2] The failure of food consumption to join with wool in an attempt at survival in 1908 may be attributed partly (but cf. § 1 of this chapter) to the consideration suggested by the remarks of Mr. Wood and Mr. Bowley (*Stat. Jour.*, 1899, *loc. cit.*) to the effect that as the standard of living becomes higher "an average fall of wages of 10 per cent. leads to retrenchment in other ways than would have an effect on our consumption curve; but 10 per cent. of the trade union members being totally unemployed means a necessary economy on every hand by those who are unfortunate enough to be so unemployed." That is, the growth of the standard of comfort leads to a closer connection between the curves of employment and food consumption.

The consumption of meat, owing to a considerable fall in the price of bacon and a moderate fall in that of mutton, suffered no diminution in 1908.

[3] The fall in coffee consumption in 1911 was just more than compensated by an increased consumption of tea: in all the years from 1884 to 1910 the curves of coffee and of tea-and-coffee move in the same direction.

tion of alcohol shows affinity with constructional rather than with other forms of consumptive activity. Thus in England there are maxima in 1873, 1881, 1890, 1899, and a marked check in the trans-cyclical fall in 1906–7.[1] The inference is that the consumption of alcohol is more subject than that of other things to the psychological influence of hope and excitement, and is a better index of mental temperature than (as Mr. Beveridge, for instance, is inclined to treat it) of genuine prosperity.[2]

But indeed detailed illustration of the habitual survival of certain branches of consumptive industry is scarcely necessary. The most prominent industrial fact of the year

[1] I have weighted beer twice as heavily as wine or spirits. The curve also shows supplementary maxima in years when there is a large sudden rise in the employment curve, to wit 1887 and 1896, and afterwards relapses somewhat. In 1876 it also shows a maximum synchronising with that of general consumption, but in subsequent periods this correspondence is lacking.

Mr. A. D. Webb, however (*Stat. Jour.*, Jan. 1903), asserts a correlation between real wages and the consumption of beer in the following year.

I have been told that the diminished consumption of beer since 1900 is partly due to the attractions and increased cheapness of bananas as a food and occupation on public holidays: and the diminution in the rate of increase of the imports of this fruit in 1906, accompanied by higher prices, the actual decrease in 1907 and again in 1910 is certainly curious when compared with the beer consumption curve. Cf. the following figures:—

Imports of Bananas.

1904.	1905.	1906.	1907.	1908.	1909.	1910.
3·9	5·7	6·4	6·2	6·4	6·2	6·1 m. bunches.
1·4	1·8	1·9	1·8	1·8	1·8	1·7 m. £

[2] It is interesting in particular to compare the figures for beer and tobacco in, for instance, 1877, the early nineties, the early nineteen hundreds, and 1908, in the light of the empirical generalisation that people tend to drink more when they are excited and to smoke more when they are depressed. In America the only exception to the rule in the text is the relapse of alcohol consumption (wines and distilled spirits and malt liquors) in 1898–9, which must be attributed to the increased excise duties on malt imposed by the act of June 13, 1898. It should be noted, however, that the constructional depression of 1903–5 is accompanied by a mark-time and not an actual relapse of the curve, the trans-cyclical trend of which is in the opposite direction from that for England.

1913–4 has been the failure of general industry to follow in the wake of the relapse of the constructional trades. The continuance of good harvests and (save for certain exceptions in India and Canada) of financial moderation have combined to make the ebb of 1913–4 an almost pure example of the type of reaction discussed in the last section, occurring in its mildest form. It must not indeed be assumed, as will be shown in the next section, that general trade will remain immune from reaction: it is only a minority of trades, notably building, printing, glass and boots, which have been actually in a better position than a year ago. But the events of the past months ought to suffice to dispel for ever the legend of that simultaneous cataclysmic collapse of general industry which is still too often assumed to be the typical form of industrial decline.[1]

§ 5. GENERAL DEPRESSION—THE LAW OF MARKETS.

Nevertheless it is apparent that in spite of the survival of consumptive industry there are certain years—in England, 1892–3 may be taken as the most conspicuous examples—which are marked by something which may fairly be called a general depression of trade, and of which cereal conditions afford an inadequate explanation. We have, therefore, to discover some satisfactory reason for the diminished activity and restricted output of consumptive industry in these years.

And first, postponing as before all complications arising out of the conduct of industry upon a wage system with the aid of a monetary economy, let us examine in its most abstract form the argument which denies the possibility of a "general over-production." The famous Law of Markets, which has played so large a part in this controversy, seems

[1] For evidence of the condition of industry in 1913–14, cf. the figures of employment collected by the *Lab. Gaz.* and summarised in Table VIII.

to be capable of two quite distinct presentations.[1] It may be so phrased as to assert that it is impossible to conceive of an excess of aggregate production over the totality of human wants, and in this form it appears to be beyond dispute. It is true of goods in general, though not perhaps of particular goods, that however many of them there are they will not be beyond the physical capacity of the population to absorb.[2] Nor is this less true in a régime of division

[1] I omit the forms in which it is stated in order to be knocked down by M. Aftalion and M. Baranowsky respectively. The former (*op. cit.*, Bk. X. ch. i.) argues at length that an over-production in one industry does not necessarily imply an actual diminution of output in any other—a proposition never, so far as I know, maintained by any one. The "under-production" in other industries affirmed to be necessary by the Law of Markets of course merely means a *relative* under-production, due to a misdirection of productive power, and indicated by a rise in the exchange value of their products.

M. Baranowsky (*op. cit.*, Part II. ch. i. §§ 2 and 4) supposes the Law to assert that all consumable goods must always be absorbed in exchange *with other consumable goods*, and advances over its dead body to the triumphant announcement of his "paradoxical" discovery that owing to the accumulation of fixed capital the aggregate production in a society may exceed its aggregate revenue *in consumable goods* without a rupture of equilibrium between demand in general and supply in general. In this progress he is assisted by his complete misunderstanding of the classical doctrine that "what is saved affords subsistence to the workman just as much as what is spent." There seems no reason to believe that the classical school in its most abstract moments was unaware that while the consumable capital "saved" is consumed by the makers of the instrumental goods for which it is in effect exchanged, these instrumental goods themselves are consumed, i.e., held in use, by the capitalist class; and no reason to suppose that the Law of Markets in any form excludes consumption of this latter kind from its purview.

[2] We need not, I think, delay over the suggestion that a "general over-production" merely means a comparative over-production of all those goods which are being produced at all, and so implies not the satiability of all wants but of all those wants towards satisfying which any attempt at all is being made. This suggestion is countenanced rather obscurely by M. Aftalion: "La crise ne consiste que dans la moindre désirabilité des biens actuellement existants. Elle ne suppose pas un amoindrissement de la capacité humaine d'aspirer toujours à plus de bien-être" (*J. d'E. P.*, 1909, p. 89), and appears to involve no theoretical absurdity; but it is clearly quite irrelevant to the facts.

of labour and exchange than in a Robinson Crusoe economy. While it may be to the advantage of particular groups of owners to destroy the stocks of their product rather than dispose of them, it can never be to the advantage of owners in general: if everybody sells freely the various products will provide a market for one another, and the aggregate satisfaction of the community derived from the consumption of goods will be greater than it would otherwise have been.

But the Law of Markets is sometimes invoked in support of a more presumptuous claim. Since the different products will find a market in each other, there can be no objection, it is urged, to continuing production on the largest scale that is physically possible; any general restriction of output is obviously unnecessary and wasteful. The simplest way of testing this assertion is by the method of *reductio ad absurdum*. Supposing it were physically possible for the human race to maintain its productive efforts throughout the whole twenty-four hours of every day, would it be to its economic advantage to do so? It becomes clear at once that it would not, and that the second form of the law of markets is based upon the elementary fallacy that the aim of economic endeavour is to maximise the gross satisfaction derived from the consumption of goods, instead of the excess of this satisfaction over the aggregate dissatisfaction involved by all kinds of effort and sacrifice. We have already seen that the temptations to over-investment may involve a general rupture between the sacrifice involved in postponing consumption and the future satisfaction procured by means of that sacrifice. It remains to add that a point may be reached where there is a similar rupture between current effort and immediate satisfaction,[1] and that the operation of industry in general on the full scale rendered physically possible by the previous orgy of investment may involve a "general over-production" in a very real and genuine sense.[2]

[1] In other words, where the effort demand for commodities in general becomes inelastic.

[2] It will at once occur to the reader that the loud complaints heard during a depression of distress from want of employment

Were the initial over-investment equal in all the consumptive trades, all alike might stand to gain by a restriction of production. In fact, however, the necessity is likely to be confined to some. Indeed we get what at first sight appears the rather startling paradox that those trades in which over-investment has been most severe may be precisely those which will be least wise to restrain output. For in a period when the effects of general over-investment are being felt, the more dysenteric trades—those, that is, which are producing on a large scale from an expensive fixed plant, and in which general are high relatively to special costs—are likely to be the hardest hit: for the exchange value of their products is likely to be considerably lowered, and the (discounted) satisfaction derived from the sale thereof to fall particularly short of the satisfaction surrendered in investment during the boom period. But on the other hand owing to the fixity of general and the relative smallness of special costs, they will be the most likely, provided the demand for their products is elastic, to lose in net satisfaction by any present restriction of output below the level of which they are physically capable.[1]

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render the suggestion irrelevant. Whether this objection is valid will be considered in connection with the peculiarities of the wage-system; here it is enough to insist that a general over-production in this sense is at least theoretically possible.

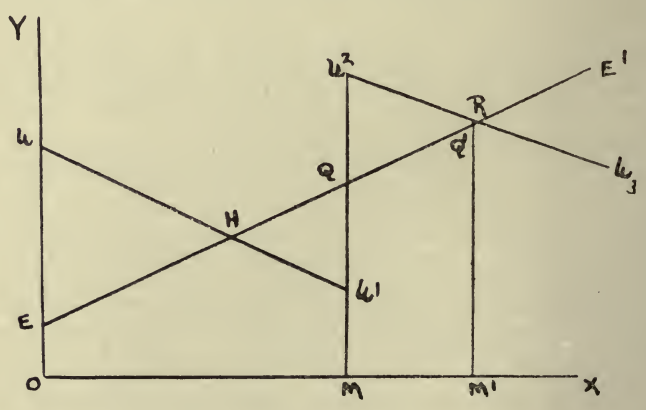
The credit for the suggestion seems to belong in the main to M. Aftalion, who in a very pregnant chapter (*op. cit.*, Bk. X. ch. viii.) at length finds the essential cause of depression in a rupture of equilibrium between cost (in the widest sense) and result. "Si les marchandises . . . se trouvent n'avoir en fin de compte qu'une utilité finale inférieure à celle qui était escomptée, à celle pour laquelle on avait consenté des sacrifices accrus en travail et en capital, il y a perte non seulement pour l'entrepreneur mais encore pour la société. . . . Le résultat est inférieur à la peine" (*op. cit.*, II. 335).

[1] Diagrammatic representation, though not completely satisfactory, will perhaps be found useful by some.

Units of (objective) effort are measured along OX, of satisfaction along OY. We may regard OM units of effort as being crystallised in the supplementary costs of the business. UU′ is the curve of satisfaction productivity, EE′ of disutility of effort. The productivity curve of the units of effort involved in the special cost of

Accordingly we find, for instance, that while the woollen industry complained loudly of depression in 1892–4,[1] the consumption of raw wool increased from 443 m. lbs. in 1892 to 462 in 1893 and 485 in 1894. In these years, as previously in 1876, Messrs. Schwarze point out that the price of the raw product was maintained chiefly by "the demands of a superabundant machinery." Again even when the dysenteric trades succumb to the temptation to restrict output, they are generally early in discovering their mistake and in assuming the hegemony in the rebirth of prosperity. Thus in 1886 and again in 1894 [2] the wool trade was among the earliest to recover. Again after the 1908 depression the woollen and worsted trades improved from November–December, 1908, and hosiery from February, 1909, while

additional output may be regarded as starting afresh from U^2; and (if output is not so much increased that R on U^2U^3 lies to the right of the intersection of U^2U^3 and EE'), the excess of UEH over QHU' is increased, or the deficiency diminished, by the whole amount $U^2RQ'Q$. [In the figure as drawn equilibrium between utility and special costs of the additional output is just secured, i.e., R and Q' coincide and $U^2RQ'Q$ is maximised.]



[1] "Last year the review of the ready-made trade was but a repetition of the discouraging story previously told" (Leeds report, 1895).

[2] At Leeds in 1894 "the home trade has not been worse than others, but better than a great many."

(among the more dyspeptic trades) employment in printing and pottery did not appreciably improve till August, nor in paper till October, nor in glass till June, 1910.[1] The peculiar position of the more dysenteric trades affords the partial exception which proves the rule of the possibility, in a genuine and important sense, of a general over-production.

In the preceding paragraph it has been assumed that the demand for the "dysenteric" commodity has an elasticity greater than one. If, however, its elasticity is less than one, the situation is entirely altered. In this case failure to restrict output will diminish aggregate receipts of producers and therefore the contribution made towards compensating for the damage done by over-investment. This fact is indeed generally recognised; what is not understood is that in such a case failure to restrict output may react adversely upon other trades as well. The source of this misunderstanding is precisely the same confusion which has obscured the treatment of the influence of agricultural conditions upon industry—namely, concentration

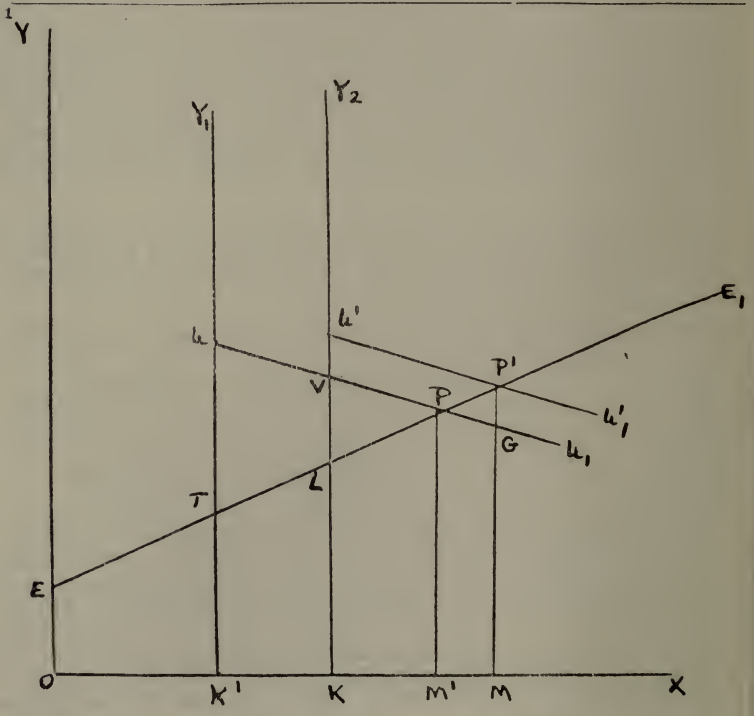
[1] This account is on the whole supported by the interesting address (quoted in *E. H.* of 1909, p. 5) made to his shareholders by the chairman of Lloyd's Bank, in which he gave the following rough classification.

Trades which remained bad in 1909.		*Trades which improved appreciably.*	
Iron.	Brass foundry.	Armaments.	Tinplates.
Cycles.	Saddlery.	Glass.	Pottery (other
Carpets.	Jewellery.	Hosiery.	districts).
Bricks.	Timber.	Mining.	Lace.
Building.	Brewery.	Iron (some dis-	Agriculture.
Pottery (some districts).		tricts).	Fishing.

Thus also the statistics of failures in various trades collected by the *Bankers' Magazine* (Feb. 1913) exhibit a maximum in 1909 for the leather and coach-building trades, and for that of chemist, and an improvement in drapery, hardware and furniture among others. Where, however (as in glass and earthenware), the evidence from these two sources disagrees with that collated in the *Labour Gazette*, I suspect the latter is the better guide.

It must be noted that the dysenteric trades were still subject to temporary relapses, boots, for instance, in June–August, wool and worsted in July–August, and lace in April–June, 1909.

upon the alteration in the ratio of exchange instead of upon the effect of that alteration upon the most profitable level of production and consumption. A reference to the argument of chap. i. § 3 will make it plain that if the demand of an industrial group A for the products of another group B is inelastic, and if the products of B are cheapened in terms of those of A, the scale of aggregate effort which yields the greatest net satisfaction to A will be diminished. Until or unless output is correspondingly reduced, A will be suffering from "over-production" in the sense in which that term has been used in the present section: indeed, in certain circumstances the net satisfaction enjoyed by A may be less than it would have been if the alteration in the ratio of exchange had not taken place.[1] In such cases,



The diagram refers to group A. Units of effort along OX, of satisfaction along OY.

if A is unable to restrict output, a restriction of output by B will be beneficial to both parties.

Now it seems that there are two supremely important groups of trades which, in a time of "general depression," are precisely in the position of our hypothetical group B—the constructional industries and the industries of transport. In both the unit of investment is very large, so that they are obliged, or at least strongly tempted, to maintain output on a very extensive scale. Both, moreover, find the demand for their products highly inelastic. With regard to the former, it seems clear that once the public mind has grasped the reality of over-investment, even a large reduction in (relative) prices will not greatly stimulate consumption.[1] With regard to the latter the matter is even clearer: for if there has been an over-production of transport facilities as compared with transportable goods, there is (so far as goods traffic is concerned) a physical limit to the consumption of transport which does not exist with regard to any kind of tangible commodity. The dysenteric tendencies, therefore, of these two important groups are by no means unlikely to give rise to a considerable measure of over-production, in our special sense, in other trades. Those writers who, like M. Lescure, find the cause of general depression in a "repercussion" from constructional industry, while their reasoning is, as a rule, unscientific and nebulous in the last degree, would seem to have hit instinctively upon an important truth.

UU_1 = curve of marginal productivity of effort in terms of satisfaction afforded by non-B commodities.

EE_1 = curve of marginal disutility of effort.

OK = units of effort expended upon products of group B.

The removal of K to K′ removes M to M′, and increases net satisfaction afforded by non-B commodities from U′LP′ to UTP. But if OM is not in fact reduced, this net satisfaction becomes UTP-PGP′. The flatter EE′ and the steeper UU′ (i.e. the greater MM′ compared to KK′) the smaller is the difference between UTP and U′LP′; and the greater also is PGP′. In some cases then the difference between U′LP′ and (UTP-PGP′) may be sufficient to outweigh the gain in net satisfaction from the products of B [not represented in the figure] which accompanies the removal of K to K′.

[1] Cf. the conclusions of Part I. chap. iii. § 2.

CHAPTER III.

The Wage and Money Systems.

§ 1. THE WAGE SYSTEM AND THE VOLUME OF PRODUCTION.

For the sake of simplicity the argument of the last few chapters has been so framed as to apply primarily to a society in which industrial policy is in the hands of co-operative groups of producers, supplying jointly the needful capital, enterprise and labour, and exchanging their products directly with one another. Existing society, however, differs in two important respects—in the differentiation of the capitalist entrepreneur [1] from the wage-earning workman and in the conduct of exchange by a mechanism of money and credit. Both these phenomena introduce important modifications into the theory of fluctuations as hitherto presented.[2]

With regard to the first. In view especially of the line of argument pursued in the last chapter, it is obviously of considerable importance that the control of industrial policy does not lie in the same hands as those by which one important class of the effort necessary for production is expended.[3] It follows that the scale of production achieved

[1] Of course the differentiation is at the present day considerably more complex. The broad classical line of cleavage seems, however, to be sufficiently accurate for most of the purposes of the present study; though in some connections we shall have to consider separately the provider of capital without risk or effort.

[2] Those modifications which are the joint result of the two phenomena will be dealt with in the place which appears most convenient.

[3] The chief suggestiveness of Professor Wesley Mitchell's recent monumental work on Business Cycles seems to me to lie in the

or projected at any given time is not necessarily that which is expected to afford the greatest net satisfaction to the community as a whole. The importance of this proposition becomes manifest when we reflect that owing to the more unpleasant and monotonous character of their work and to the greater urgency of their material wants, the effort-demand of the working classes for commodities in general is likely to be considerably less elastic throughout its course than that of those whom I will call for the sake of brevity the business classes.

Thus there is good evidence that in times of boom in any trade the high value attached to leisure by the manual workers is a factor which operates to restrict production below the level at which the business man desires to maintain it. This influence is particularly strong in the coal trade, where the marginal utility of "a straight back and the sunlight" is naturally peculiarly high. Thus Mr. D. A. Thomas repeatedly complains that in times of high prices and high wages there is a strong tendency among colliers to work less hard, so that the output per man is diminished; and gives the following figures in illustration:—

	Great Britain.			South Wales.
	Price.	Output per man.		Output per man.
1870 .	9·47*s.* per ton	321 tons	..	320 tons
1874 .	10·98*s.* ,,	235 ,,	..	222 ,,
1888 .	8·27*s.* ,,	333 ,,	..	
1891 .	11·96*s.* ,,	296 ,,	..	
			Wage Index.	
1899 .	10·53*s.* ,,	320 ,,	100	294 ,,
1901 .	13·73*s.* ,,	287 ,,	140	254[1] ,,

emphasis laid on this fact. "In practice," he says, "industry and commerce are thoroughly subordinated to business. . . . The industrial and commercial processes by which goods are furnished are conducted by business men in quest of profits. . . . An investigation into the ebb and flow of contemporary economic activity must concern itself primarily with the phenomena of business traffic—that is, of money-making" (*op. cit.*, pp. 25–6). I cannot, however, agree with him that this aspect of the question has hitherto been unduly neglected.

[1] Article on coal exports, *Stat. Jour.*, 1903. Cf. the same authority in *Fortnightly Review*, 1893, p. 301, and his comments on a paper by the present writer, *Stat. Jour.*, Jan. 1914, p. 174.

The tendency, however, is not confined to the coal-trade. It has recently been a source of considerable embarrassment in the Liverpool docks, where it has been intensified by the self-denying ordinance of the employers as to the restriction of imported labour. Again in 1889 "towards the end of the year especially there were frequent complaints that in some branches of trade the men were not working so steadily as they did when wages were lower." [1] And when to Dr. Rost's attribution of the German depression after 1900 in some part to the laziness of the workpeople when they could earn as much in four days as previously in six, Professor Ashley replies that there is no evidence for this effect of increased prosperity, his answer does not seem to be in accordance with the facts.[2]

It is by no means clear, however, that a restriction of production arising from this source is necessarily undesirable in the interests of national welfare. In the case of the dockers, a notoriously improvident class, it may be so; though Mr. Keeling is, I think, justified in remarking that "it is not to be expected that the docker should suddenly become anxious to work for six days a week at a laborious employment, in order to suit the convenience either of employers or of social theorists. Least of all can this be expected at times when owing to a system of overtime and night-work he can earn relatively large sums of money in a short time." [3] But in occupations where the equalisation of earnings between man and man and year and year is better understood it seems even more clearly desirable that no small part of increased prosperity should be taken out in increased leisure. The didactic and somewhat priggish attitude of the other classes in this matter is well illustrated in the article already quoted from the *Econo-*

There seems no reason to doubt that this was an important contributory cause of the temporary restriction of coal production, pending the influx from the new mines, in 1874, 1892, 1901 and 1908.

[1] *Economist History* of 1889.

[2] Ashley, Review of Rost "Ueber das Wesen und die Ursachen unserer heutigen Wirtschaftskrisis," *Economic Journal*, 1905, p. 230.

[3] *Economic Journal*, March, 1913, p. 15.

mist,[1] and seems to spring partly from the superior attractiveness of their own work and partly from their habituation to that apparent tendency of workpeople to regard work as an end in itself which is inseparable from a wage-system.[2] But the workpeople appear to remember better than their critics the truth of the Aristotelian sentiment ἀσχολιάν σχολῆς εἶναι χάριν.[3]

At a time, therefore, when the productivity of effort in terms of commodities is exceptionally high, a curtailment of output may be in the best interests, if not of the business leaders, at any rate of the majority of producers. Moreover, since at such a time labour is likely to be scarce, and since in some trades, especially where piece-work is the rule, regularity of attendance and maximum intensity of effort are difficult to secure, it is by no means unlikely that the interests of wage-earners will be of some weight in determining the course of industrial policy.

Now it would seem at first sight that a time at which the effects of a general over-investment are being felt is precisely such a time as this. The commodity-productivity of effort is enormously increased, and it might be supposed that the result would be a general attempt by the wage-earners to restrict output, partially successful in its issue, but strenuously resisted by the employing class. It is well known that the real facts are precisely the reverse. In resolving this apparent paradox,[4] several considerations must be borne in mind. First, while post-

[1] "Something of this kind, however regrettable though it be, we must always expect to find in times of reviving prosperity. There is a certain proportion of men who will not bind themselves to work except under the spur of necessity, and who, when the price of their labour rises, prefer to take the benefit of it rather in the form of greater relaxation than of larger earnings."

[2] Cf. Macgregor, *The Evolution of Industry*, p. 24; and also Taussig, *Principles*.

[3] *Politics*, VII. 14, 13.

[4] For M. Rist's conclusion ("Relation entre les variations annuelles du chômage, des grêves et des prix," *Journal d'Economie Politique*, Nov. 1912) that "le chômage volontaire est d'autant plus fort que le chômage involontaire est plus faible, et réciproquement," though based on the study of a different type of voluntary employment, is impossible to resist.

poning still a full discussion of the direct effects of a monetary system, we may without indiscretion disclose that it operates at such a time in favour not only of the restriction of production but of the accumulation in store of a considerable part of what is actually produced. To this extent the flow of goods available for the consumption of wage-earners is diminished, and the rise in the commodity-productivity of their effort is checked—checked perhaps to such an extent that the point at which their effort-demand for commodities attains an elasticity less than one is never reached. Secondly, it should be remembered that an important cause of the "general over-production" established in the last chapter is the inelasticity of the demand for goods transport and for the products of constructional industry. But this is a demand which proceeds almost entirely from the business classes. Hence, while it is true that the effort-demand of the working-classes *for consumable goods* is less elastic than that of the business classes, it by no means follows that in such periods as those under consideration the same relation holds between the effort-demands of the two classes for *all* those commodities which are included within their respective economic horizons. For these reasons it is plain that the scale of production which commends itself to the business classes may be smaller than that which commends itself to the working classes.

Moreover, when the situation is thus reversed, the business classes will be in a better position to enforce their control of industrial policy. For while an employer cannot easily compel a workman to work more than he wishes to, he can, through his control of the access to the instruments of production, effectually prevent him from working as much as he wishes to. It follows that the complaints of involuntary unemployment among the wage-earners need not make us doubt the correctness, as far as concerns the business classes, and therefore the course of industrial policy, of our diagnosis of the industrial malady. It follows also that no solution of the problem can be com-

pletely satisfactory which aims merely at the fulfilment of the policy which the enlightened self-interest of the business classes would dictate, and neglects the genuine want of harmony between that interest and the interest of the working-classes. It is perhaps strange that the numerous writers, from Sismondi to Mr. J. A. Hobson, who have found in capitalism as a juridical system the main cause of industrial depression, should have failed to detect this particular manifestation of the opposition between the interests of " capital " and " labour," and have supported a very tenable position by arguments the validity of which we shall find it impossible to admit.

§ 2. MONEY IN THE BOOM.

The influence of a money, especially of a credit money, economy upon the course of trade is of such obvious importance that it has more or less completely hypnotised all but a very few of those who have contributed to the discussion of this problem. The fact that our long, complicated, and perhaps not unfruitful discussion has been conducted so far almost entirely without reference to specifically monetary phenomena relieves us of the necessity of a formal refutation of those who, like Clement Juglar and Mr. Hawtrey, find in monetary influences the sole and sufficient explanation of industrial fluctuation.[1] It is to be hoped

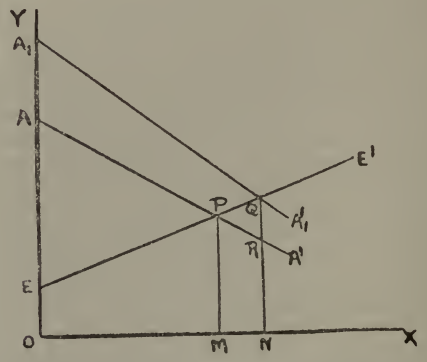
[1] To these writers must now be added Messrs. Bilgram and Levy (*The Cause of Business Depressions*), who find the sole cause of depression, as of most other economic evils, in scarcity of currency. Interest, according to these writers, is paid not for the use of capital goods, but purely for the use of money, the only convenient mechanism by which the business man can make that selection and aggregation of capital goods which he requires. But the quantity of notes is (in America) directly, and that of bank credits indirectly, limited by law, while that of gold is limited by nature. Pure interest is, therefore, a monopoly price exacted by the creators of currency, for which there is no natural necessity, but which results solely from antiquated legal restrictions. The free " monetisation of credit " would result in the disappearance of interest and of trade depressions, and would have the further advantages of facilitating the speedy transfer of land values to the State and of enabling the execution of public works on a colossal scale without the inconvenience of contracting a public debt. The enormous confusions here in-

that it has also saved us from the fate of those who, like MM. Aftalion and Baranowsky, while professing to dig below the mere money surface of things, are always prone to relapse into monetary terms at all critical stages of the argument. But we are not thereby absolved from considering in detail the real modifications introduced by a monetary system into our theory as it stands.

First, then, with regard to the boom. An increased volume of currency, whether due to an increased confidence in the breasts of bankers, or to an increased supply of metallic money, will tend, it need hardly be argued, to raise the general level of prices. If all prices (including wages) were equally affected, the result would probably be a general increase in production beyond the point which is in fact most advantageous: for it seems to be a natural tendency of every man to suppose that the product which he sells will be more rapidly and deeply affected by any current price-movement than the products which he buys either for personal consumption or for industrial use.[1]

volved scarcely need demonstration; it is sufficient to inquire why depressions occur in England where the volume of bank credits is not even indirectly limited by law, and what the evidence is of that permanent plethora of real capital crying out to be borrowed gratis which is the basis of the authors' optimism. Cf. review by present writer in *Stat. Jour.*, July, 1914, p. 15.

[1]



Units of effort along OX, of utility along OY.

In fact, however, the influence of an increased volume of currency is considerably more complicated. Even if it consists originally in an increased supply of gold, it is now sufficiently well established that it operates through the medium of the banks, who by lowering the rate of discount place a larger volume of credit currency in the hands of business men. Business men thus benefit in two ways. First, from causes either purely psychological (an uprising of confidence) or purely technical (an increased gold basis), the services of bankers (which consist fundamentally in the transfer of the control of resources from those who possess but do not wish to use them to those who wish to use but do not possess them) are supplied to them at a lower money cost.[1] Secondly, with the increase of currency the goods in which they deal and of which they must dispose to make repayment, are likely to appreciate in money value on their hands, so that the real cost of the services of bankers is lowered to them even more than the money cost.

Nor does this exhaust the gains of business men. Since the service of saving (in so far as they do not provide it themselves) is supplied to them at a cost habitually reckoned in money, and since there is no reason in our present argument to suspect an alteration in the remuneration which savers intend to demand, the rising prices will lower the real cost to them of this service also. Precisely the same may be said of the service of manual labour, save that the sanction of habit is not, as in the case of *already existing* loans, reinforced by that of law, so that the gain to business men is less prolonged. But all these gains are a genuine inducement to business men to enlarge the scale of production, which is therefore increased still further beyond

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EE′ = curve of marginal disutility of effort.

AA′ = curve of actual
A_1A_1' = curve of anticipated } marginal productivity of effort, prices having risen in the ratio $A_1A : AO$.

Then total volume of effort expended = ON instead of OM and total utility enjoyed = AONR, which while $< A_1ONQ$ is $> AOMP$.

[1] It is, I think, worth while in the interests of clear thinking to separate in analysis the payment for this service from the payment for the service of saving. Cf. J. M. Keynes in *Ec. Jour.*, Sept. 1913, p. 396.

the point which would be most advantageous to the community as a whole than in the simple instance with which we started this discussion.

The following figures [1] lend considerable support to the contention that a falling money rate of discount combined with a rising price level is of importance in the initial stages of an industrial boom. Professor Fisher's theory of the

	Average Bank of England Rate of Discount.	Prices (Sauerbeck's Index).		Average Rate of Discount.	Prices.
1870	100·0	100·0	1896	100·0	100·0
1871	93·0	104·2	1897	106·0	101·6
1872	132·2	113·7	1898	130·5	104·9
1873	154·5	114·8	1899	151·0	111·5
			1900	160·1	122·9
1879	100·0	100·0			
1880	109·9	100·0	1904	100·0	100·0
1881	139·1	102·4	1905	91·2	103·2
1882	164·2	101·2	1906	129·7	110·8
1883	141·7	98·8	1907	146·4	115·1
1887	100·0	100·0	1910	100·0	100·0
1888	98·4	102·9	1911	94·6	102·6
1889	115·8	105·8	1912	102·7	109·0
1890	134·6	105·8			

[1] Collected by Miss England in a criticism of Professor Fisher, *Quarterly Jour. of Ec.*, Nov. 1912, p. 95. The first year of the series is in each case taken as base. I have supplemented Miss England's figures by those for 1904–7 and 1910–12.

According to these figures the booms culminating in 1907, 1873, 1912, and 1890 were (in that order of merit) in large measure due to inflated currency, while those culminating in 1883 and 1900 were not. This conclusion, as regards the last-named period, is supported (in opposition to certain popular impressions about the influence of the Transvaal mines) by the evidence recounted in chap. i. § 2, and by the figures of the Bank's gold holdings during the period and of the net imports of gold up till 1898. The large net imports of 1899 must, I think, be regarded as an effect rather than

paramount importance of the rate of interest,[1] though we shall find reason to attack it later, seems here at least to be on solid ground.

The lagging of money wages behind rising prices is now so generally admitted as scarcely to require detailed illustration : [2] but the following table is instructive :—

	Money Wages.	Wholesale Prices.
1879	83·35	125
1880	83·27	129
1887	81·45	98·8
1888	83·58	101·8
1896	89·24	88·2
1897	90·05	90·1
1905	95·94	97·6
1906	97·60	100·8

(Board of Trade Indices, 1900=100.)

The general result thus far obtained is liable to modification in accordance with the features of the industrial situation. This point will require further elaboration ; at present it need only be observed that any temptation to over-investment that may exist will be aggravated by an increase in currency. For in the first place the transference of resources to business men is a transference to those who are most prone to use resources in investment ; and further in the contingency contemplated those business men who are most concerned with dealings in constructional goods are likely to obtain the largest share of the increased volume of currency. In the second place the fact that the rising price-level lowers the real rate of interest actually demanded below the rate which savers mean to demand is particularly unfortunate at a time when the expected future productivity

a cause of the great increase in the volume of production of goods in that year.

It should be added that the currency inflations of the early 70's and of the 1900's seem to have been initiated by an increase in gold imports, while the feebler inflation of the late 80's was of the nature of a pure credit boom.

[1] Cf. *Purchasing Power of Money*, chap. iv.

[2] This lagging of money wages helps to accentuate the fall in the indices of general consumption in the early stages of industrial revival ; cf. chap. i. § 5, *sub fin.*

of constructional goods is abnormally high, and when only the exaction of a high rate could prevent an unduly rapid absorption of resources in investment.

In Germany in particular, where more than anywhere else the machinery of the banking system has been deliberately used in the development of permanent investment, the degree of over-investment attained seems to be largely determined by monetary conditions. Thus there is no reason to doubt that the boom of 1871–3 and the subsequent collapse were very much accentuated by the payment of the 1,000 million francs war indemnity from France. Again in 1894–5 the enormous increase of gold supplies [1] co-operated effectively with invention in giving birth to the over-investment which culminated in 1900. Conversely the mildness of the boom and relapse of the 80's must be attributed in part to the comparative scarcity of gold.[2]

[1]

	Gold holdings of Reichs Bank.	Net imports of gold.	Deposits of joint-stock banks.
	£ m.	£ m.	£ m.
1893	25·0	1·9	77·9
1894	29·4	12·6	100·0
1895	33·5	·8	112·2

[2] It is interesting to contrast France, where in spite of a steady diminution in the Bank's holdings, the "invention" of the ore supplies of Lorraine and the Freycinet scheme of public works were sufficient of themselves to produce a considerable amount of over-investment.

Cf. the following figures:—

	Cash reserve of Prussian Bank.
	£ m.
1870	4·3
1871	6·0
1872	8·6
1873	11·1

(Lescure, *op. cit.*, p. 131).

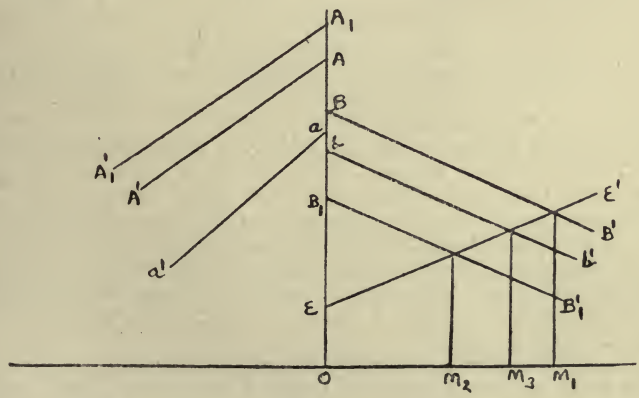
	Gold holdings of Reichs Bank.	Deposits of German Banks.		Gold holdings of Bank of France.
	£ m.	£ m.		£ m.
1879	10·4	26·3	1878 ..	37·9
1880	10·7	26·4	1879 ..	28·5
1881	9·8	33·9	1880 ..	27·9
1882	9·9	31·3	1881 ..	23·3
			1882 ..	35·2

(Layton, *Introduction to Study of Prices*, pp. 137, 140).

§ 3. MONEY IN THE CRISIS AND DEPRESSION.

Secondly with regard to the weeks or months of actual crisis. The exceptional advantages, whether real or imaginary, enjoyed by business men cannot continue for ever. So far as the gain from rising prices is purely illusory, the fact is bound sooner or later to be discovered: the anticipated productivity will fall till it corresponds with the real productivity of effort, and the volume of production suffer restriction.[1] Nor are the real gains much more persistent; the money charges for the provision at least of *new* savings and of *some* kinds of labour will be screwed up to correspond with the real charges which those who provide them intend to make. Moreover, the charge for the services of banks will be increased. In so far as its fall was due to expanding confidence, that confidence is likely to have been replaced by distrust due to the increase of resources in reckless or incompetent hands, and aggravated perhaps by some conspicuous failure. In so far as it was due to an increased gold basis, that source of support is likely to have been removed by the withdrawal of metallic currency into circulation to

[1] If, however, the working-class realisation of error occurs *after* the point at which the effort-demand for anticipated commodities becomes inelastic, it will very possibly set up a reverse movement towards an enlargement of production.



AA′ = curve of anticipated commodity productivity of effort.

support the higher level of prices,[1] and especially to discharge the higher money wages bill.[2] The result is a drastic curtailment of credit currency, effected by a more or less sensational rise in discount rates and sometimes by an actual refusal of accommodation even at high rates and on good security.

It must be carefully observed that this argument by no means commits us to an endorsement of Professor Fisher's view that the fundamental cause of the crisis consists in the money rate of interest catching up with the rise in the price-level, and so abolishing the bounty received by business men at the expense of their creditors. Miss England's figures, quoted in the last section, make it plain that in this country at all events the rate of discount has always begun to rise considerably faster than the price level some time before the collapse comes. It is indeed obvious, if our reasoning in chap. i. § 5 is correct, that the payment of a high real rate of interest is not a decisive deterrent to the business man if he is still convinced of the high future satisfaction productivity of investment: it needs either a positive shortage of investable resources, or a growing disillusionment on his own part, to stem him in his wild career. Monetary influences, though they aggravate the severity of the crisis, are not its essential cause.

The relative scarcity of currency makes its influence felt

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aa′ = curve of actual commodity productivity of effort.
BB′ = curve of anticipated satisfaction productivity of effort.
bb′ = curve of actual satisfaction productivity of effort.
EE′ = curve of disutility of effort.

The further raising of AA′ to A_1A_1', *ex hypothesi* lowers BB′ to B_1B_1', but (unless a is raised above A) does not lower, and may raise, bb′. It is not unlikely then that B_1B_1' will fall below bb′; in this event production having been restricted from OM_1 to OM_2 will on the realisation of error be expanded to OM_3.

This consideration may, I think, conceivably be of some importance, especially in the coal trade; but it is impossible to be certain.

[1] Cf. Marshall, *Evidence before Gold and Silver Commission*, Cd. 5512–1, 1888, Q. 9643.

[2] The clearness and emphasis with which this point is presented seems to be the most solid and original contribution made by Mr. Hawtrey to this subject. Cf. *Good and Bad Trade*, p. 75.

in two ways. The earlier and less conspicuous is a slight fall in general prices, especially the prices of (manufactured) consumable goods. It is this preliminary *monetary* superfluity of consumable goods which has so often darkened counsel, and distracted attention from that real shortage of consumable goods which is the essential feature of the situation. Thus in England in 1900, employment in the tin-plate and engineering and metal trades did not begin to give way till June, nor in pig-iron till July, nor in iron and steel manufacture till October [1] nor in shipbuilding till November: while in a number of consumptive trades it had already broken in April and May. And among these trades it seems that the relapse began at the end nearest consumption. Thus boots declined in May, leather not till July; printing in April, paper in May. Thus also building was on the whole well maintained till November, but furnishing only till June. Similar evidence comes from the metal and wood-working trades. For instance, in July at Wolverhampton employment with moulders and bridge and girder makers is busy, with cycle and motor makers quiet; with makers of nuts and bolts and builders' ironmongery good, of stamped and light hollow-ware moderate, of locks, keys and latches quiet, of spectacle frames and steel toys slack. At Redditch it is worse with ordinary than with machine needles; at Coventry it is quiet with cycle, good with tool-makers: while at Birmingham it is already moderate with tool-makers but still good with iron-founders and pattern-makers.[2] At Nottingham in September it is good with packing-case makers, mill-sawyers and machinists among others, but only moderate with basket-makers,

[1] The large fall in July was due mainly to holidays and hot weather.

[2] *Lab. Gaz.*, Aug. 1910, p. 245. Contrast the conditions during the latter half of 1902, when the demand on the whole was good except for structural work (*E. H.* of 1902). At Birmingham, for instance, in September employment among ironfounders, pattern-makers, etc., was by now only moderate, but good among makers of household articles, hollow-ware, stoves, lamps, pens, etc. (*Lab. Gaz.*, Oct. 1902, p. 292).

brush-makers and box-makers.[1] In July, however, printing, in August bespoke tailoring, paper, glass and leather began to recover and continued fair on the whole till the end of November; but the more dysenteric trades—worsted, boots, ready-made tailoring, hosiery—failed on the whole to share in this recovery.

In 1907[2] again there was already by June a change in the woollen, worsted, silk, lace, hosiery, and boot trades from an increasing[3] to a decreasing wages bill, and employment began to decline also in furnishing, ready-made tailoring, and the motor and cycle trades.[4] Again the relapse clearly began from the end nearest consumption—at Nottingham, for instance, lace and hosiery machine-makers continued to prosper in June and July, while the trades to which they ministered suffered—and again, while the dislocation was in no case severe (the textiles were on their feet again by August) the dysenteric trades suffered most: thus glass was not hit till July, while paper, pottery and hats were untouched. In America in the same year it will be remembered that boots and hardware[5] were among the earliest sufferers.[6]

[1] *Ibid.*, p. 308. It is difficult to produce any very coherent results from the mass of evidence of local and temporary fluctuations collected by the Board of Trade; but the above instances, though not, I confess, taken at random, seem to represent the general trend of events.

[2] It must be borne in mind that in this period the situation was complicated by agricultural influences.

[3] That of hosiery began to decrease slightly in May, and that of lace in April.

[4] "The cycle industry showed a considerable decline compared with a month ago, and discharges of men were reported at Coventry, Redditch and Birmingham. In the motor trade employment was fair, but not so good as a month ago" (*Labour Gazette*, July 1907, p. 204).

[5] Similarly unemployment in the clothing trades in New York State had already increased before the crisis, from 7·8 per cent. in June to 10·0 per cent. in September. So also in Canada in 1913 there appears to have been a "contraction in the market" for general manufactured goods, while the steel industry of the maritime provinces was still unaffected (*Ec.*, Jan. 17, 1914).

[6] Mr. J. M. Keynes, in a criticism of a former draft of this work, complains that the argument "tends to confuse a falling-off in

The later and more dramatic effect of a restriction of currency is to cripple the operations of business men by a stoppage of the supplies of credit money on which they are accustomed to rely for financing the current operations of their business. The natural result may be summarised as a general restriction of production, accompanied by a general temporary increase in consumption, due to the unloading of stocks. The effect of dear money varies considerably, however, between one industry and another, and seems to permit of the following generalisations.[1]

First, those trades are severely hit in which the rate of profit on the turn-over is small compared with the annual rate of profit. This seems to be the case with certain branches of the engineering trade, where valuable contracts are carried through on a small commission, so that the margin of profit is easily wiped out by a rise in the rate of interest.

Secondly, trades making use of a raw material in which there is a highly organised speculative market are likely as a rule to benefit by dear money. Thus in the months of money-famine October, 1907, to January, 1908, woollen and cocoa manufacturers frankly welcomed the high rates, and agricultural buyers benefited by the loosening in rain of the great nitrate clouds which had been banked up in Chili. Tanners might have been expected to profit likewise, for merchants who had been loading and salting their hides now unloaded them upon the market; but as a matter of fact they seem to have held out for a still lower price,

consumptive production with a falling-off in consumption." He seems inclined to doubt a fall even in the monetary demand price for consumable goods, and to refer the decline in employment in the consumptive trades to a diversion of productive energy into constructional industry. The phenomena under discussion would thus become a further proof of the argument of chap. ii. § 2. I am inclined in large measure to agree; but I think the behaviour of the dysenteric trades in particular lends some support to the argument in the text as an additional and not unimportant explanation of the course of events.

[1] Based mainly on two very interesting articles in the *Economist* of 1907, pp. 2,022 ff. and 2,071 ff.

while obliged themselves to unload their stocks of leather, so that the boot manufacturers were the chief gainers; employment in that industry improved steadily, while in the leather trades it became considerably worse. Similarly the Bessemer converters and steel rolling mills in the Cleveland district [1] seem to have made a temporary gain in December from the unloading of pig-iron stocks.[2]

The beneficent aperient effects of dear money are, however, liable to be cancelled by special circumstances. Thus the electrical industry failed to profit in 1907 from the forced sales of copper: for in the first place the high money rates made it so difficult to remit money for wages, etc., to the far western mines of Utah, Arizona, and Montana, that production was very quickly curtailed; and in the second place they were a severe check to the enterprise of municipalities, on whom the electrical industry largely depends. Again, though jute manufacturers are not severely affected by high rates,[3] they were prevented by the sudden collapse in the American demand from reaping the full benefit of the large supplies "forced off at considerable sacrifice" by the Indian exporters.[4] The sugar trade failed to profit because the unloaded stocks were to some extent held up by the insufficiency of water in the continental rivers; and the meat trade, because American shippers were induced by the poor market for hides to kill fewer cattle, being presumably able to recoup themselves for the expense of carrying their live stock in a time of dear money by squeezing the growers.[5]

[1] *Lab. Gaz.*, Jan. 1908, p. 11.

[2] It is odd that Mr. Hawtrey (*Good and Bad Trade*, p. 62) neglects altogether this side of the matter, and directs attention only to the effect of dear money in reducing the stocks of *finished* goods.

[3] According to a Dundee banker (*Economist, loc. cit.*). The employment figure was on the whole well maintained (*Lab. Gaz.*).

[4] And the manufacturers themselves seem to have been speculating, believing, in the almost Æschylean phrase of the *Dundee Advertiser*, "that prices were securely established on the higher platforms not for a long time to be ousted" (*E. H.* of 1907. Cf. Part I. ch. iii. § 1).

[5] The furnishing and wood-working trades would seem at first

It should be observed that the stimulus thus given to certain industries is only a temporary one. Where the previous high prices have been due to purely speculative action (as in 1907 with leather and cocoa) its effect may be beneficial; but where (as on the same occasion with sugar and nitrate) the statistical position is genuinely unfavourable to consumers, the frustration of legitimate efforts at inter-temporal compensation can only lay up trouble in the future.

It may be added in this connection that the transport industries tend to gain from the enforced liquidations. Thus in the autumn of 1907 there was a temporary recovery in North Atlantic and other freights,[1] and in December employment at the London docks for the first time for seven months showed a substantial improvement on the previous year.

Thirdly, those trades which either make for special order or for such a wide and speculative demand that there is a highly organised market in the finished as well as the raw product suffer more than those which make for a steady and uniform demand. For the former group, since they do not enjoy a continuous inflow of receipts, are particularly dependent upon outside financial aid: thus in the money-famine of 1907 the *Labour Gazette* reports from the bespoke are much more unfavourable than those from the ready-made clothing trades: and the motor trade also was hard hit, the system of exacting part payment in advance having recently been abandoned under the stress of competition. With these trades may be contrasted those which had been making for a steady market and were in possession of a favourable bank balance—coal especially, and wool manufacture, which was "quite able to handle all the stock

sight to have had a good chance to profit, for not only was the timber trade severely affected by dear money, but its chief customer, the building trade, was in a similar condition. It appears, however, that the stocks of mahogany and other exclusively furniture woods were not large, and that in any case the furnishing trade is too closely bound to the wheels of its building colleague to take much advantage of cheap supplies.

[1] Mr. John White's *Circular*, 1907.

required without overdrawing" : glass, paper and tobacco [1] were likewise unaffected.[2]

With regard to the second group the exigencies of merchants work both ways. Thus the cotton industry is not directly dependent on cheap money, as the continued activity of the spinning branch in our test months shows ; but we learn that "the houses engaged in shipping Manchester goods to foreign countries are finding it rather difficult to finance their transactions, . . . and doubtless they are in many cases so arranging quotations as to prevent business which cannot conveniently be financed going through, and this naturally reduces the payment for yarn and cloth." Thus employment in the weaving branch declined appreciably in November. The linen trade was similarly affected : "owing to financial stringency several American houses engaged in the trade have cabled requesting that goods on order for present shipment be deferred," and employment was curtailed in November and still more severely in December.

Fourthly, the more luxurious trades are harder hit than those making for common consumption. In part this may be attributed to the fact that they often make for special order, but in part also to other causes. Thus the managing director of Humber Ltd., who makes the generalisation from the experience of the motor industry, points out that the purchase of a car is apt to be regarded as capital rather than current expenditure, and to involve the selling of securities—an unprofitable proceeding when money is dear. But that the cheaper luxuries suffer as well is suggested by the more rapid fall of employment in these months in the lace than in the other clothing trades, and by the immediate drop in November in the fancy leather trade [3] and in the china furniture branch of the pottery trade,[4]

[1] The Imperial Tobacco Co., with bank-rate at 7 per cent., was able to invest in 16,000,000 lb. of Kentucky leaf without turning a hair.

[2] Thus also, while the wholesale dealers in tea were hard hit, the large retail distributors, who collect their money day by day, were able to profit at their expense.

[3] Contrast *Labour Gazette*, 1907, pp. 339 and 371.

[4] *Ibid.*, pp. 341 and 374.

while the clay tobacco-pipe branch of the same trade remained unaffected. Now people do not sell securities to buy china ornaments, and the phenomenon in question should be attributed, I suggest, rather to the fact that high money rates hit in general not so much the manufacturing as the merchant class, who have no wages bill to help to bear their losses.

And now with regard to the effect of a monetary economy when the crisis gives way to depression. The memory of disaster, combined with the lack of confidence which naturally accompanies the real unprofitableness of further investment, prevents both business men from demanding and bankers from supplying any considerable increase in the volume of credit currency. This shortage of currency, combined with the influx of the new supplies of consumable goods, leads to a progressive fall in money prices. As the divergence between the real and the anticipated productivity of effort operated during the boom to stimulate production, so now it operates to restrain it. Moreover, just as business men were then obtaining a bounty at the expense of savers and wage-earners, so now the stability of money rates of interest and wages forces them to pay over a bounty to these classes ; and to the fictitious inducement to restrain production a real inducement is added.

The reality of the transfer to wage-earners, until either the rate of wages is reduced, or production and the opportunities for employment are restricted, is indicated by the comparative course on such occasions of the more " necessary " and the more " luxurious " branches of certain trades. Thus in 1892, while at Leeds (the centre of the ready-made clothing industry) " there has been a fairly steady volume of trade," at Huddersfield the failure of many firms making fancy woollen and worsted goods was recorded.[1] Similarly

[1] In 1901, however, the pressure of war taxation and in 1908 the pressure of dear wheat obscured the issue in the woollen trades ; so that in 1901 " manufacturers of the superior class of fabrics have fared much better than their fellows, devoted to the production of medium and low-class goods," and in 1908 " the class of trade a little below the best " (*Ec.*, 1909, i. 661) has suffered less than the cheaper varieties.

in 1900 the "luxurious" printing trade was among the first to be affected, and ready-made survived bespoke tailoring by three months. Again in 1908 the luxury trades seem to have been on the whole the heaviest sufferers—silk and leather throughout the year, lace till July, motors and cycles till October. Moreover, it should be remembered that most of the evidences of the survival of general consumption after the collapse of the "boom" are evidences in particular of the survival of working-class consumption.[1]

When, as seems to have been the case in the 80's, business men are able immediately [2] to meet an obstinate wage-rate by a thorough-going extension of the use of machinery, the inducement to curtail production is limited, and in spite of increased unemployment and a diminished aggregate money wages bill, the manual workers, in common with other classes, may enjoy a continuous increase in consumption.[3] Otherwise business men are apt to bear the loss for an appreciable period, but eventually to make reprisals by a restriction of production, which reacts upon the workers both by curtailing employment and by limiting the fall in prices.[4] It should be observed, however, that the

[1] The maintenance of working-class incomes tends to mitigate the special disabilities of the "dysenteric" trades; for though some dysenteric trades are of course "luxurious" (cf. Dr. Marshall's celebrated aneroid barometers), on the whole the correlation is surely the other way.

[2] For the important effects of this and similar devices at a later stage, cf. p. 126.

[3] Thus while money wages were actually higher in 1885 than 1882 (149, according to Mr. Bowley's index [1850 = 100] as against 147) the aggregate wages bill (Bowley, *Ec. Jour.*, 1904, p. 459) had fallen from £470 m. to £440 m. or 6·4 per cent.; but production and consumption continued to increase. The aggregate of incomes subject to tax fell from £590 m. to £580 m. or only 1·7 per cent.—a curious commentary on Dr. Marshall's opinion (Evidence before G. and S. Commission) that there was a depression of profits to the advantage of wage-earners.

[4] Cf. the following figures:—

	Wage Index.	Wages Bill. £ m.	Taxable Incomes. £ m.
1890	163	550	640
1891	163	555	635
1892	162	545	625
1893	162	545	630

final and most acute stage of depression tends to occur after a considerable readjustment of wage-rates has taken place (e.g. in 1878–9, 1886, and 1904 [1]) : indeed the impulse given to production by the removal of the tax upon business men actually enhances the purely monetary and illusory inducements to restriction.

Such are the aggravations of the phenomena of depression for which a monetary system must be held answerable. On the other hand it is only fair to point out that it facilitates that quest of mutual markets which is the best hope of the consumptive trades at a time of constructional collapse. Whatever the ideal scale of production for any given industry at any time may be, the sheer dislocation caused by the failure of an important customer, country or industry is certain, until new adjustments can be made, to restrict the actual volume of production and still more of sale below the ideal level.[2] But with the assistance of a money

[1] Among the results of the similar revision of wage-rates in March 1908 (for which see *Lab. Gaz.*, Jan., 1909, p. 3), were an immediate fall in employment in the glass *bottle* branch, which had hitherto supported the employment figure for the whole industry, and a more gradual fall in wool and reversal of the relative movements of ready-made and bespoke tailoring.

[2] Thus even the woollen trade, which we have taken as the classical example of the survival of consumption, seems to have been nonplussed in 1875 by the depression of its iron and steel neighbour. Again, while neither the initial relapse of the consumptive trades in 1900 nor their continued slackness in 1901 can be ascribed mainly to the failure of the demand of constructional industry (shipbuilding employment in 1901 did not seriously fall off till September, tin-plates improved rapidly from March, and in pig-iron there was a decided temporary improvement from May to September, when the dysenteric trades were at their worst) ; yet it is perhaps significant that the checks, in February–May and again in October, to the decline in the activity of iron and steel manufacture coincided closely with the attempts at revival in the dysenteric trades, and its renewed decline in June with their collapse (even the subordinate minimum in April was accompanied by a relapse in worsted). (That at this time the causation was in this direction is suggested by the fact that the intermediate engineering trades do not share the movement.) Again in the first half of 1908 the trades most dependent on the demands of America and of constructional industry—worsted, linen and lace—were among the severest sufferers, but recovered, partly owing to the discovery of new markets, in the latter half of the year.

mechanism it is very much easier to develop new markets than it would be under a system of direct exchange : though indeed it would be easier still if the business man could overcome his distrust of falling prices.

§ 4. GOLD,—MEDICINE, POISON, AND INTOXICANT.

In the preceding sections we have been assuming, in common with most writers on this topic, that an influx of new gold, to whatever extent it may be responsible for the boom, in fact tends to synchronise with that and with no other phase of the industrial cycle. Neither general reasoning, however, nor the evidence of facts supports this view. It seems that such an influx may occur at any time, and that its effects may cut across and complicate as well as merely intensify those of purely industrial phenomena. Dr. Marshall's famous generalisation, that " if there is an extra supply of bullion, bankers and others are able to offer easy terms to people in business, including the bill-brokers, and consequently there is more money on loan, and consequently people enter into the market as buyers of things, as starting new businesses, new factories, new railways, and so on,"[1] seems to be only a partial presentation of the truth.

What, for instance, are we to make of the following figures for 1894–6 ?

	Gold Holdings of Bank.	Net Imports of Gold.
1893	£26,425,000	£4,670,000
1894	34,309,000	11,924,000
1895	38,951,000	14,636,000
1896	44,334,000	−5,637,000
1897	35,571,000	Zero

In America the dependence of the clothing trades upon constructional industry is still more intimate (partly through the medium of the ebb and flow of immigration) ; hence their continued depression, after the readjustment of the balance of trade in 1910, until the metal boom of 1912 was well on its way.

N.B. also the dependence of the cotton trade on German constructional industry, cf. p. 163, n. 1.

[1] C. 5512–1, 1888, Q. 9677.

Yet 1894–6 were years of falling prices, constructional depression (except for the brief reflex from the U.S.A. in 1895), and absence of speculation. Paradoxically enough, it was not till some of our large gold supplies had been bled off, largely to America,[1] that prices began to recover. The solution seems to be that the effect of new gold in the closing years of depression is purely sedative and medicinal. It is possible that the mere existence of large gold reserves and a low rate of discount leads people to *think* that prices are about to recover, and so to be less afraid first of buying other people's goods, secondly of consenting to *immediate actual* reductions in the price of their own, which they believe will only have to be temporary, and thirdly of making for stock. Thus the steady fall in the unemployment figures in 1894–6 and the considerable, if quiet, volume of business done must be ascribed in part I think to the soothing influence of the new gold supplies. When the revival of the volume of trade is well on its way, the increase of confidence leads to an application to the banks for accommodation, the accumulations of gold are partly used as a basis for increased credit and partly withdrawn to meet a rising wages bill, and prices rise. At the risk of incurring suspicion of a gross and elementary fallacy, it must be boldly stated that in such a case the actual rise in prices is the result rather than the cause of the increase in the volume of trade. In any event, even when the influence upon prices is not so long delayed as it was in the 90's, its effect at such a time is not necessarily to precipitate a constructional boom, but, as a Cambridge lecturer has phrased it, "to cheat" producers in general "into being sensible."

On the other hand an influx of gold at a time when the real trouble is still a pronounced shortage of consumable goods will only serve to postpone the rebirth of genuine

[1] U.S.A. net imports of gold.

1894	− £16,126,000
1895	− 14,114,000
1896	+ 9,295,000
1897	− 51,000
1898	+ 28,394,000

prosperity. For its effect as a stimulus to production is outweighed by the fact that it is obtained at the cost of other and more desirable goods. Thus America's vast gold imports after the 1907 crisis, though necessary for the re-establishment of her financial system, involved a vast compensatory export of agricultural and other produce that could ill be spared, and thus accentuated the shortage of real capital and the inflation of prices which was rightly described as the really disquieting feature of the situation.[1] America in 1908–10 was in the position of a man who has asked for a cocktail before his dinner, and then finds there is no dinner to follow, but only a succession of cocktails. Similarly the reopening of the Johannesburg mines after the war, and the consequent continued large inflow of gold into this country in 1901–2, aggravated rather than mitigated the difficulties of the situation ; and it was an advantage to England and not a disadvantage that in 1903–4 she was able to take a smaller part of her income in the form of gold.[2]

On other occasions the effect of new gold may be partly medicinal and partly poisonous. Thus the steady resumption of general activity on a moderate scale in this country in 1909–10 was, I think, partly due to the fact that the price adjustments necessitated by the 1907 crash were rendered less severe by the new gold than they would otherwise have been. But on this occasion, unlike the 90's, there had been no enormous growth in the volume of production, and the energies of the new gold could not thus be so readily absorbed. The inevitable result was speculation, but speculation not this time in constructional enterprise, but in raw material. All the evidence shows that

[1] Cf. p. 173.

[2] Cf. the following figures :—

	World's Gold Production.	British Net Imports of Gold.	Gold Holdings of Bank of England.
1900 . . .	377 tons	£7,793 thousand	£33·3 million
1901 . . .	390 ,,	6,750 ,,	35·8 ,,
1902 . . .	425 ,,	6,219 ,,	35·6 ,,
1903 . . .	481 ,,	890 ,,	34·4 ,,
1904 . . .	500 ,,	837 ,,	34·4 ,,

the main rises of price in 1909 were not due to a very large improvement in the genuine industrial demand but to speculative activity in the earlier stages. In spite of large supplies the index of British wool rose from 124·8 to 141·2 and that of foreign wool from 98·6 to 100·6: the manufacturing industry indeed, according to the *Economist's* reports, was good, but "the raw material bossed the show." Similarly in the linen trade "everything points to a sharp advance, owing to an increase in the price of flax."[1] The rise in the price of pig-iron in the latter half of 1909 was not justified either by home [2] or foreign [3] demand, but was due mainly to speculation in warrants,[4] on the strength of the American demand. But the largest rise was in rubber, the average import price of which rose from £14·56 per cwt. in 1908 to £20·20 in 1909 and £29·76 in 1910.[5]

But it was not only to speculation in produce that the new gold was diverted. The rubber boom on the Stock Exchange is still fresh in the memory. It is noteworthy that in 1909, while the amounts cleared at eight provincial bankers' clearing houses only increased from £651·5 [6] million to £673·6 million or 3·4 per cent., those cleared at the London Bankers' Clearing house, which are much more subject to Stock Exchange influences, increased from £12,120 million to £13,525 million or 11·6 per cent., while the amounts cleared at the London house on Stock Exchange account days increased from £1,672 million to £2,129 million or 27·3 per cent.

[1] *Ec. H.* of 1909.

[2] It was indeed a source of serious inconvenience to shipbuilding; cf. *Ec.*, 1910, i. 65.

[3] Our total exports of pig-iron fell from 1,296,521 in 1908 to 1,140,695 in 1909; though our exports of iron and steel goods to America rose from 149,792 to 242,555 tons.

[4] *Ec.*, 1910, i. 381.

[5] The net result was a considerable alteration of the ratio of exchange to our disadvantage; "if the prices of 1908 had prevailed," calculates the *Economist* (1910, i. 370), "we should have paid nearly £6 m. less for our imports, and got £15 m. more for our exports."

[6] The figures are from the *Stat. Abs. U.K.*

When the absence of a genuine investor's demand became plain, speculative activity turned away from pig-iron, whose price remained stationary January–April, 1910, and then fell. But other commodities were ready to take up the running. In spite of the slackness in building, timber began to advance in February, and the effect upon prices of the shortages in the 1909 crops of American cotton and European sugar was intensified in 1910 by large bull operations. In the latter part of 1910 the same thing happened with flax and jute, after crop shortages in Russia and India respectively; and the same conditions prevailed throughout the year in all kinds of vegetable oils. By 1911 rubber was normal again, but its place had been taken by coffee and tin.

After 1911 speculative dealings in raw produce fell on the whole into the background before the genuine advance of consumptive activity and constructional investment. But it is clear that during the preceding years gold had been a two-edged weapon. On the one hand it had put artificial hindrances in the way of manufacturing activity: on the other hand it must, on my view, be admitted to have facilitated the adjustment of prices, the re-birth of confidence, and so the large volume of exchange in which the more harmful side of its activity was ultimately swamped. Nowhere is the double action better seen than in the leather-using industries. The boot trade was, as we have seen, among the most cheerful in 1908–9: yet in 1909 "boot and shoe makers have not been able to obtain the full advances which the price of leather would justify"[1]: and again in the spring of 1911, though the boot trade was enjoying a considerable measure of prosperity, tanners were still being severely squeezed by the high prices of hides consequent on American speculation.[2]

It is interesting to compare the course of speculation in these years with Professor Cairnes' generalisations as to the probable effects of the great gold discoveries of the late forties.[3] He concluded (*a*) that the countries of the world

[1] *Economist History* of 1910. [2] *Economist*, 1911, p. 210.
[3] *Essays on Political Economy*, cf. esp. p. 65.

would be affected in the following order : (1) the producers, —California and Australia ; (2) the countries with an elaborate credit system and a high productivity,—England, the United States, and to a less degree the Continent ; (3) the irresponsive and absorbent East. (*b*) The different classes of commodities would be affected as follows : (1) those would rise first which were consumed by the " productive " classes, especially the working-classes ; (2) while manufactures might rise rapidly at first, they would soon, owing to their tendency to dysentery, fall below the general level ; (3) among agricultural products, the tendency to suffer from dysentery and a fall would be more conspicuous among things vegetable than among things animal ; (4) the last things reached would be those consumed by the non-productive classes, through a limitation of supply caused by diversion of capital and labour to other trades.

These expectations seem to have been in the main confirmed in 1848–56.[1] The initial rise, for instance, was greatest in timber, which Australia had produced for herself, but now imported in exchange for gold, and in animal products,—meat and wool, which she had been in the habit of exporting, but now neglected for the gold-diggings. But in modern times the conditions under which the gold-mining industry is carried on and the growth of speculation and of a credit economy have introduced important modifications. (*a*) It is now the commodities purchased by the gold-receiving and not the gold-producing countries which are most rapidly affected ; and owing to the internationalisation of currency and the diminishing urgency of the demand of tropical countries for manufactures, their products are more quickly and fiercely sucked into the rising stream,—as not only the rubber boom but the generally more rapid rise of recent years in the Indian than the European price-level bears witness. (*b*) 1 and 4. The direct effect of gold on retail prices is no longer important : commodities consumed by the working-classes rise *not* in

[1] See Jevons, *Investigations in Currency and Finance, passim* ; and cf. Kemmerer, *Money Credit and Prices*, pp. 58 ff.

response to an increased demand from those classes but owing to speculation further back: and since the new currency passes first into the hands of the profit-receiving and speculative classes, the commodities which they consume rise faster than those consumed by the working-classes; (2) seems substantially true and very important,—more true than it was in 1848–56, when British manufactures had a virtual monopoly, and when the rise in their price seems to have dictated that of the raw material.[1] But (3) the growth of speculation and of structural enterprise has made both mineral and vegetable products more sensitive to the touch of gold as compared with animal, so that the order for combined celerity and permanence of effect is now rather vegetable-mineral-animal than animal-vegetable-mineral.

The differences in the operation of new gold in the three chief industrial countries are also worthy of remark. It seems to be roughly true that in Germany the two main alternative uses are speculation in foreign securities and the development of home, especially home constructional,[2] industry: the reasons are to be sought in the strictness of the German laws concerning produce speculation and the close connection of the German banks with industry. In America all kinds of speculation are open: but in so far as such speculation puts money into the pockets of the growers of food and other raw produce, we have seen that it is likely to react pretty quickly upon constructional industry, whence the meteoric recovery of the iron industries in 1909. In England speculation based on the new gold catches hold of and intensifies any genuine movement of demand and supply which it finds to hand,—the temporary American inquiry for pig-iron in 1909, the shortage of various raw products in the following year: but it has no necessary tendency to produce, either directly as in Germany or indirectly as in America, an attempt at an all-round con-

[1] Cf. Jevons, *op. cit.*, p. 52.

[2] It is especially instructive to contrast the course of events in England and Germany in the middle nineties; cf. Part I. chap. i. § 2.

structional revival. Hence England is the country with regard to which it is most necessary to adopt a sceptical attitude towards Dr. Marshall's generalisation quoted at the beginning of this section.

§ 5. THE THEORY OF UNDER-CONSUMPTION.

It has not seemed advisable to interrupt the argument of this chapter at any point in order to make incidental comment upon the famous theory of "working-class under-consumption" invoked by most socialistic writers to aid in the explanation of industrial depression. It is therefore desirable to give some consideration to it here in connection with the whole trend of the preceding argument.

The theory, as rehabilitated by Mr. J. A. Hobson with so much skill in his *Industrial System*, may be briefly stated as follows. The receivers of industrial "surpluses,"—rent, profits, etc.,—are enabled to satisfy with part of their income every conceivable want, and can think of nothing to do with the balance except save it. The consequence of this extensive automatic investment is a glut of consumable goods, which is a real glut, because those who have the power to consume the goods have not the desire and those who have the desire have not the power.

It may be observed first, in the light of our ch. i. § 5, that in attempting to make good this position Mr. Hobson meets with one difficulty which appears to be of his own creation. In anticipation of the obvious criticism that since investment in constructional goods does not continue on an extensive scale during the depression, the latter cannot fairly be said to be a period of over-saving, he is at much pains to show that investment by the wealthy classes continues in various forms, especially in the form of the purchase of house property and land,[1] throughout the depression. Mr. Hobson is here undertaking—and in my judgment with only qualified success—a work of supererogation which is forced upon him by his confusion of two quite distinct processes,—

[1] *Op. cit.*, p. 292.

saving and the use of savings in investment. The mere fact that during the depression large quantities of consumable goods are held up in store instead of being circulated and consumed is sufficient to prove that the volume of saving, in the proper sense of the word, is very considerable, and to suggest that it is greater than the interests of the community as a whole would dictate.

What then, according to this theory, is the cause of this persistent accumulation of consumable goods? Mr. Hobson appears to hold that it is strictly and literally inevitable. "The machinery of industry must become congested and clogged by excessive goods unable to find an exit in consumption."[1] To the argument that a general acquiescence in a lower price level would result in all the goods being taken off the market, he replies that "the second check, the effect of falling prices due to increased production in stimulating spending and so checking saving, has no true efficiency. For the first direct effect of falling prices is a corresponding fall of money incomes, which as we have seen are derived from retail prices by distribution at the various stages of production: and if money incomes fall *pari passu* with prices, there is no reason to expect that a fall in prices will stimulate demand for commodities. . . . The play of elasticity of demand is here inhibited by falling incomes."[2] This argument appears to contain a double fallacy. In the first place while we have seen reason to suppose that there is in fact as a rule at such a time a decrease in the aggregate of money incomes, it is a pure confusion to say that this diminution is *caused* by falling prices. The aggregate volume of money incomes depends on circumstances affecting the supply of currency, which Mr. Hobson makes no attempt to take into account: if the falling price level results simply from an increased volume of goods, it is theoretically quite possible for the aggregate of money incomes to remain undiminished. In assuming that a fall in prices necessarily diminishes the aggregate of money received, or in other

[1] *The Industrial System*, p. 52.
[2] *The Industrial System*, p. 286.

words expended, Mr. Hobson is assuming as axiomatic the very point—the inelasticity of money demand—which he requires to prove. Secondly, even if the aggregate of money received is diminished, there is no reason to suppose that the aggregate of consumption will not be increased; all that is required is that the percentage reduction in the price level should not be less than the percentage reduction in the aggregate of money incomes.

But Mr. Hobson has also occupied a more plausible position. If the desire of "surplus-receivers" for consumable goods is really capable of saturation, it will simply not be worth their while to take the trouble to unload their stocks. From sheer lack of incentive to act they will enforce abstinence upon the working-classes. The strength of this argument lies in its recognition of the comparative rapidity with which the utility of consumable goods diminishes to the rich, and of the fact that a period of depression is to some at least a period of great potential prosperity. Its fatal weakness lies in its failure to realise that there is no reason to suppose the desire of the rich for *construction* goods to be satiable: and that the complaints (however liberally discounted) of business men, together with the stability of money wages and the "luxurious" character of the trades which suffer most during at any rate the earlier stage of a depression, compel us to conclude that even the consumptive wants of the rich are not completely satiated. In this case, whatever may be said of a policy of restriction of output, a policy of mere accumulation is clearly against the immediate interests of business men in general.

It may, however, still be maintained that accumulation is in the real interests of business men because they are right in expecting an ultimate rise in the marginal utility of the accumulated goods.[1] This is indeed one aspect of

[1] Mr. Hobson (though making use of course of a different phraseology) seems to expect such a rise from the mere growth of population (*op. cit.*, p. 306). This would of course involve a benefit to the "haves" at the expense of the "have-nots," which would be exhibited in a fall of real wages. But it seems that in a depression the growth of population is as a rule accompanied by at least an

Mr. Hobson's central entrenchment—the position that the unequal distribution of wealth produces a chronic tendency to what is from a social point of view an uneconomic distribution of income between immediate consumption and storage or investment. Now if all this proposition means is that the intensity of the immediate wants denied by those to whom the greater part of our saving is in fact due is less than the contemporary intensity of the immediate wants of less fortunate classes, the point is so generally admitted as to need no further discussion. If again it means that a persistent tendency (exhibited in alternate periods of accumulation and investment) among western progressive nations to over-estimate the intensity of future as compared with present wants is aggravated by the existing system of ownership and distribution, the whole course of our argument again leads us to acquiesce. But we must dissent from Mr. Hobson in his implication that the successive generations of workers reap no advantage from this tendency, and might not, but for monetary maladjustments, reap a still greater advantage; and in his assumption that a more equal distribution would bring no perils in another direction. If Mr. Hobson and socialistic writers in general could bring convincing proof that the abolition of capitalism as a juridical system would bring no tendency to a chronic *under*-estimation of the intensity of future wants,[1] their general position would be immeasurably sounder, though the arguments by which they support it would remain in large measure fallacious.

equal growth in productivity: and that such a decline in real wages as occurs at the beginning of a revival is amply explained by monetary considerations. The rise in the marginal utility of goods (so far as it is not purely monetary and imaginary) must be ascribed rather to a rise in actual or estimated future productivity (cf. ch. i. § 5).

[1] Cf. Beveridge, *Unemployment*, ch. ii..

CHAPTER IV.

Conclusion.

§ 1. RECAPITULATION.

It remains to conclude with a brief recapitulation of the theory of fluctuations presented in the preceding pages, and with some suggestions as to practical remedies.

The former can best be presented in the form of a continuous narrative of the successive phases of a "typical" industrial cycle. It is scarcely necessary to point out that the study of any particular actual cycle must not be expected to reveal the phenomena enumerated in either the same simplicity or the same completeness: or that for the sake of clearness certain qualifications and complications already discussed at length have been completely omitted.

Starting then at the nadir of depression, we find that the aggregate of industrial production begins to increase beneath the following influences:—(1) A general increase in the physical productivity of effort due to the adoption of improved methods, etc., under the stimulus of depression; (2) an increase, due to an increased bounty of nature, in the exchange value of industrial products against the products of agriculture; and (3) an increase in the expected future productivity of constructional goods, due either (i.) to the wearing out of an exceptionally large number of existing instruments, (ii.) to the discovery of the industrial possibilities of a new country, or (iii.) to some physical or legal invention. Production is still further increased by (4) the expansion, whether owing to an increase of confidence or to increased supplies of gold, of the volume of credit currency, which (i.) induces each producer to expect a rise in the

exchange value of his own product, (ii.) cheapens the reward which bankers intend to demand for their services, (iii.) owing to the tendency of savers of capital, wage-earners and bankers to demand a reward fixed in terms of money, affords an additional bonus to those in whose hands the determination of the volume of production mainly lies. Finally, the volume of consumption is increased even more than that of production, for some of the above influences, in addition to stimulating production, offer an inducement to the absorption of accumulated stocks into the vortex of exchange.

But in the course of time (1) the physical productivity of effort declines owing to the relapse into wasteful methods of production and to the operation of the law of increasing cost; (2) agricultural shortage turns the ratio of exchange against industrial products; and (4) the monetary stimulus to increased production, so far as it is illusory, disappears with the realisation by each producer that the rise in prices is not confined to his own product,—so far as it is real, is reversed by waning confidence, by a depletion of gold reserves, and by the revision, in accordance with the rising price level, of the claims of savers, wage-earners and bankers.

The reversal of (3), as being less generally understood, demands somewhat fuller recapitulation. Since each new investment, once it is made, will be capable of functioning for a considerable period, the rise in the utility of new construction goods will often in any case only be temporary; a point will be reached beyond which any further investment would involve a sacrifice of present enjoyment disproportionate to the enjoyment which will be afforded by the new consumable goods which it is proposed to create. In fact, however, owing to the stress of competition, aggravated by the length of time which must elapse before the new instruments projected can be brought into working order, investment is likely to be carried beyond this point. Indeed, it is possible that the absorption of resources in investment may be so rapid that owing to the exhaustion of accumu-

lated stocks it will for a time be physically impossible to maintain investment on the scale on which it has been begun. If the " period of gestation " is prolonged, or if the absorption of resources is aggravated by war or other exceptional causes, or if the resources are absorbed wholly or mainly in investment in a group of industries producing one or two particular types of commodity such as transport facilities, this stage may be considerably prolonged.

In any case, whether or no there is actual over-investment, and whether or no there is actual depletion of stocks, a decline in the demand for constructional goods will occur. As to the consumptive trades, they will, as the period of gestation closes, be inconvenienced by the difficulty of disposing of their increased output at existing prices,—a difficulty enhanced by restriction in the supply of currency, and by the failure of the accustomed demand from those engaged in the constructional trades: but the volume of their production and mutual consumption will on the whole for a time be well maintained.

But (i.) the diminished productivity of their effort (in terms of satisfaction) due to the decline in the urgency of their desire for constructional goods, will constitute an inducement to the leaders of consumptive industry to restrict the volume of production. This inducement will be strengthened by (ii.) the real disability imposed on business men by the relative fixity of money wages, etc., and (iii.) the illusory disability imposed by a falling level of general prices, which will also lead to an accumulation in store of a considerable part of what is produced. In the course of time disability (ii.) will be wholly or partially removed, but the others will remain, and the features of depression continue to prevail until the forces enumerated at the beginning of this summary come into play.

§ 2. REMEDIES—THE BOOM.

When fairly faced, the problem of the prevention of industrial fluctuation becomes nothing less formidable than the problem of maximising the community's aggregate of

net satisfaction through time,—in other words of attaining the best distribution through time of its income of consumable goods which is practicable without undesirable restriction of the total of that income.[1]

In the light of this definition we may lay down the following propositions. The desired aim is likely to be furthered first (subject to certain modifications)[2] by anything which increases the tendency to inter-local and inter-temporal compensation in agriculture; secondly, by anything which, without sacrifice of efficiency, reduces the necessity for discontinuity in the process of investment; thirdly, by anything which diminishes the tendency to miscalculation either during the "boom" or the "depression"; and fourthly, by anything which mitigates those incidental effects of over-investment during the boom which prevent it from being followed by a very large volume of consumption during the "depression."

With regard to the first point, certain developments and proposals tending in the required direction, have already been incidentally discussed, and no more need here be said. With regard to the second, something may be expected from such devolution and decentralisation of industry as is likely to result from the increased use of electrical power: but in the main this particular source of malady seems to be one for palliation rather than for prevention.

As regards the third point, the possible remedies may be summed up under four headings,—improvements in industrial structure, improvements in public knowledge, improvements in banking policy, and improvements in monetary mechanism. I propose to discuss these in turn.

(1) The excesses of investment during the boom are admittedly due in no small measure to the prevalence of competition and the ignorance on the part of each individual producer of the scale of the preparations which have been

[1] A restriction of this total may be desirable if it is more than compensated for either by an improved distribution through time, or by the saving of effort: cf. p. 200.

[2] Cf. pp. 50 and 153, n. 1.

and are being made by his competitors. Combination, by pooling information and prospective markets and so facilitating a common investment policy, may be expected materially to reduce the temptations to over-investment.[1]

But before acquiescing in the claims of monopoly,[2] we must observe that they are sometimes presented in a different form which may well give us pause. Combination is often recommended upon the ground that it will enable prices to be kept comparatively steady. Those who are disposed to deny its usefulness in this respect generally base their opposition either upon the ground that in fact the alternations of unquestioned monopoly power and of the apprehension of new competition lead to a considerable unsteadiness of price policy ; [3] or else upon the ground that steadiness of prices is dearly purchased by the community if it means steadiness at a high level.[4] It is less common to find an appreciation of the fact that from the present point of view it is by no means clear that steadiness of prices is desirable.

[1] "Whatever increases the size of business units," says Professor Jones (*Economic Crises*, p. 51), "by reducing the number of independent unknown elements in the business situation simplifies the problem" ; and he quotes with approval, though with a warning that the remedy may be worse than the disease, the Hon. Carroll Wright's dictum that "if the employers in any industry would combine under an organisation that should have positive coherence, there would be no difficulty, so far as that industry is concerned, in regulating the volume of production in accordance with the demand."

[2] One prima facie objection to these claims seems to be unsound. It is true that in fact monopoly is at present most prevalent in those industries in which the unit of investment is large and indivisible, and the likelihood of over-investment therefore great. But monopoly control is not responsible for the large size of the unit ; the character of the business would lead in any case to conditions of large-scale or "monopolistic" competition. Nor would the passing of small-scale industry under a large unit of control necessarily involve a change to a larger unit of productive power ; so that while the extension of monopoly would not diminish it would not necessarily increase the temptation to over-investment arising under this head.

[3] Cf. Jenks' account of the course of sugar prices in America since the formation of the Trust (*The Trust Problem*, pp. 133 ff.).

[4] Cf. Macgregor, *Industrial Combination*, Part III. chap. i.

And first with regard to the raising of prices during the boom period. The policy recommended to the German cartels by their theoretical patrons and apparently carried out fairly conscientiously in 1895–9 was to "moderate the rise and maintain reasonable prices with a view to not discouraging consumption."[1] Thus in each of the years in question the price of pig-iron in the Ruhr district was kept appreciably lower than was necessary to hold the market against English importations. Coal prices in Germany rose only some 50 per cent., in England some 80 per cent. between 1895 and 1900. A similar policy was pursued in 1901 by the United States Steel Corporation, which in May of that year publicly announced that it would make no further advance in steel prices.[2] This action naturally wins the admiration of the "costs of production" theorists. "Plein de modération," says M. Lescure, "de prévoyance et d'esprit de suite, il a substitué à l'ancienne politique cristallisée dans la formula *to make hay while the sun shiness* (sic) la politique du débouché stable par un prix stable."[3]

But that surely is to beg the whole question at issue. Can a stable market be secured by means of a stable price? If Mr. Hull is right in holding that the maximum rate of construction during a boom is one which could and should be permanently maintained, perhaps it could. But if we are right in holding that in a boom too great a proportion of the nation's resources is being devoted to constructional uses, it follows that the raising of prices by a constructional combination is not only excusable but is its bounden duty if it is to pose as the guardian of the true interests of society.[4]

[1] Lescure, *op. cit.*, p. 559. [2] Hull, *op. cit.*, p. 117.
[3] Lescure, *op. cit.*, p. 569.
[4] There seems indeed to be some disagreement among the doctors as to the actual nature and effects of combination policy in America. M. Lescure lays emphasis on its moderation in 1897–1903 and on the mildness of the subsequent depression, and ignores altogether the depression of 1900–1. Mr. Hull, on the other hand, lays stress on the "spectacular" advance in the price of iron in 1899, on the failure of the Steel Trust's self-denying ordinance in 1901, and on the great severity of the depression which followed in each case. It would obviously be just as logical to connect the occurrence of both depressions with the "moderation" in price policy, and

A new stage of the problem arises when by some means over-investment in the sight of God has been converted into over-investment in the sight of man and the spirit of enterprise is dead or dying. In this stage it is urged upon the combinations that "from death to life they might him yet recover" by a policy of vigorous price-reduction; and the "cost" theorists are loud in their complaints against the Steel Trust, which after the 1907 crisis refused to submit to any reduction of prices till February 19, 1909, and against the Raw Iron and Coal Cartels, which by the device of two or more year contracts maintained prices throughout 1900–1. Yet even in this stage it seems quite likely that the snake of investment-mania has been scotched, not killed: and that the head if not the heart of the Steel Trust deserves more credit for attempting to prevent the American people from wasting their scanty stores of real capital on further construction in 1908 than for its self-denying ordinance in 1901, or for the lowering of prices in 1909 which prepared the ground for the meretricious and disastrous little iron-spurt of that year.[1]

their comparative mildness with the failure to make this moderate policy effective. On the whole, Mr. Hull's account of the course of prices seems to be decidedly the more correct. Cf. the following figures (*Stat. Abs. U.S.A.*, 1912, p. 550):—

	No. 1 Foundry (Philadelphia).	Bar Iron (Pittsburg).	Steel Billets (Pittsburg).
1898 . . .	11·66 ..	23·93 ..	15·31
1899 . . .	19·36 ..	43·75 ..	31·12
1900 . . .	19·98 ..	48·12 ..	25·08
1901 . . .	15·87 ..	40·38 ..	24·13
1902 . . .	22·19 ..	43·53 ..	30·57

But even if M. Lescure's account were correct in this respect, we have seen reason to take exception to his refusal to recognise the reaction of 1900–1.

[1] Competent German observers support this view with regard to that country in 1900–1, only that in this case it was in the breasts of the iron producers and not of the "purse-string holders" that the snake lingered. "It was objected that the situation in the iron industry was one of over-production and reckless competition, and therefore any concession made in the price of coal would be immediately followed by further underbidding in the sale of iron Herr Kirdorf says that if the prices [of coal] had been lowered considerably, the crisis would have been much severer. Herr

It should be observed in conclusion that the argument for the exaction of high constructional prices would remain valid even if a greater stability in the general price level were to be secured by monetary reform; but that in the absence of such reform an artificially low level of constructional prices is doubly ill-advised.

The general conclusion is that combination would have it in its power to restrain in certain important directions the tendency to over-investment; but that it is uncertain whether it would in fact do so; and also whether the advantages to be obtained would in any case be sufficient to outweigh the general arguments against monopoly control.

(2) Even, however, without actual combination, a somewhat saner and more centralised investment policy might perhaps be secured by a greater publicity and diffusion of information. It may be suggested that a detailed report of new contracts for structural work or machinery in any trade should be compulsorily submitted to the Board of Trade, who should be obliged to prepare in the *Labour Gazette* or elsewhere a monthly analysis of such reports. The experience of the shipbuilding industry, however, leads one to doubt the efficacy of such knowledge, without the intelligence to draw inferences therefrom, in restraining the actions of business men.

Further, either by private or governmental action, the available information as to the condition of stocks should be vastly improved. This applies not only to instrumental goods, but to raw and manufactured consumable goods as well. It is indeed true that the mere existence of information will be of little use unless accompanied by a wider understanding than at present prevails of the true meaning of over-investment, and of the real if limited element of truth still contained in that theory of the wages-fund so long discredited by professional economists. But proper information might well be the first step towards the acquisi-

Junghann says that the low prices of iron in Germany are the result of the over-competition of the German iron producers" (Walker, *Monopolistic Combinations in the German Coal Industry*, p. 236).

tion of understanding: for the rest, it seems that we must still wait for some kind of Employers' Educational Association which will enable theorists and business men to pick one another's brains with the same frankness and mutual respect which is coming to prevail between the former and the working-classes.

(3) This consideration leads us naturally to the third remedy—an improvement in banking policy. It seems clearly on the whole desirable that a banker in making a loan should have more explicit knowledge, not simply of the actual security accepted as collateral, but of the prospects with which the loan is applied for, and the purposes for which it is used. The existing "no business of mine" attitude of English banking in this respect has indeed great incidental advantages, especially in the avoidance of the suspicion of anything like tied contracts:[1] but it renders it impossible for the banks to assist as efficiently as their influence and prestige would otherwise enable them to do, in preventing an undue absorption in permanent investment of those consumable resources the title-deeds to which are entrusted to their control.

(4) The defects of our existing system of currency have attracted such universal attention in recent years that little remains to be added here. Briefly it may be said that from our present as from a more general point of view any reform which would make the volume of currency vary in response to the amount of work it has to do and to no other influence would be on the whole beneficial. For a definite scheme, reference may be made to the proposals of Professor Irving Fisher.[2]

We must, however, be on our guard against condemning all the movements at present manifested by the price level in the course of an industrial cycle as wholly injurious. Three instances in particular may be given.

(1) The influx of gold and the fact or expectation of a

[1] Cf. an able and instructive article by a leading banker in *War and Peace*, June, 1914.

[2] *Purchasing Power of Money*, pp. 337–347.

higher level of prices has an important influence in the early stages of the boom in raising the volume of production and exchanges from an undesirably low level. It is true, however, that the need for this medicinal influence is mainly contingent on the misapprehension generated by the previous fall in the price level: so that a completely steady level would go far to remove the whole difficulty.

(2) More important is the consideration that the accumulation of stocks during the depression is largely caused by the falling price level. Without denying that this process is frequently carried to an extent prejudicial to the best interests of the community, we must remember that it is on the existence of such accumulations that the community largely depends for its power to take advantage of any sudden invention. Unless we can count on a uniformity in the progress of invention and the development of new countries which seems at present outside the bounds of practical politics, it is by no means clear that a uniformity in the level of stocks is desirable. How far the scale of accumulation is dictated by monetary misapprehension, how far by sheer satiety, and how far by wider views of industrial prospects, it seems impossible to determine: but it is at least possible that a steady price level would have dangers of its own in rendering the community unprepared to take advantage of new acquisitions of industrial knowledge and power.

(3) Finally, the falling price level immediately consequent on the crisis gives a bonus to the working at the expense of the employing class, which is prima facie desirable in the interests of society. It has indeed been urged in influential quarters, notably by Professor H. S. Jevons [1] and Professor Pigou,[2] that labour organisations would be wise in their own interests voluntarily to surrender the bonus, and to acquiesce more readily than at present in a falling level of money wages. On the other hand it must be remembered first that if the men are employed in constructional industry, the demand for their labour at such a time is likely to be inelastic, and the aggregate income of members therefore lessened, even

[1] *Causes of Unemployment*, ch. II. [2] *Unemployment*.

though unemployment be avoided, by the acceptance of lower wages: secondly, that there seems reason to believe that the employer is frequently for a considerable time unable or unwilling to retaliate by curtailing employment.[1] On the whole I cannot help feeling that, in spite no doubt of errors of judgment, the Trade Unions have known their own business in this matter better than is always admitted,[2] and that the falling price level at such times is a real source of social advantage.

§ 3. REMEDIES—THE DEPRESSION.

Finally, we have to consider those incidental effects of over-investment which deter the community from enjoying to the full during the depression the large income of consumable goods which over-investment has rendered physically available.

The difficulty arises from the inelasticity at such periods of the demand for, in particular, the products of the transport and constructional trades. We have already seen (p. 205) that this constitutes an inducement to business men in other trades to restrict production, and that in so far as they are unable to do so, a restriction of production by constructional producers may in certain circumstances be beneficial not only to themselves but to other business men as well. We may now add, in the light of ch. iii. § 1, that even if consumptive leaders find restriction easy, such restriction will not be in the interest of consumptive wage-earners, and that since constructional restriction will remove the inducement to consumptive restriction, an additional

[1] Cf. p. 226; Professor Pigou's whole discussion of sliding scales (cf. *Industrial Peace*, Part II.) seems to me to under-estimate the extent to which the brunt of short-period fluctuations is borne by the employer.

[2] The advantages of a viscous money wage in (*a*) stimulating improvements (*b*) affording a visible token of bargaining strength must also be considered. M. Baranowsky, however, seems unduly confident of the advantages of the growing divergence which he detects (*op. cit.*, pp. 337 ff.) between the English curves of unemployment and of real wages in the 1908 depression, and which he ascribes to the power of Trade Unionism.

argument emerges in favour of the former. Finally, restriction is clearly in the interests of constructional producers themselves: and it seems that the increase which it makes in their aggregate net satisfaction will be likely in any case to exceed any accompanying decrease in the net satisfaction of other classes, since their need for consumptive goods is *ex hypothesi* more urgent than the need of those other classes for constructional goods. The classical doctrine of cartel policy, therefore, which advocates restriction of production and export of surplus stocks in time of depression, seems to have more to be said for it than some modern critics are inclined to admit: and the argument for monopoly control of constructional industry not only during the boom but during the depression is thereby strengthened.[1]

Restriction therefore, while at best only a δεύτερος πλοῦς, is in the circumstances an effective one: it does not follow, however, that it is the only one. Its advantage consists in the maintenance of an artificially high rate of exchange of constructional against consumptive goods: but this advantage can be obtained in at least two other ways. In the first place, we may notice the plausible suggestion of Mr. Hull that by making for stock in bad times, a combination will be able to prevent inconvenient pressure on the stocks of constructional materials in the ensuing boom. He justly remarks on the strength of the "cyclical delusion," prevalent in every period of low iron prices, that high prices will never come again. Yet nothing can be more certain, on the

[1] With regard, however, to the third consideration mentioned in the text, it should be observed that in so far as the combination has made abnormal gains by maintaining socially beneficial high prices in time of boom, it may fairly be expected to sacrifice itself to an equivalent extent to the rest of the community in time of depression. It is by no means clear, however, that it will have made such gains on the whole; in particular in the transitional period after the first breaking of the boom it seems probable that while the demand schedule is lowered its elasticity is greater than unity (cf. pp. 64 and 245), so that the maintenance of beneficially high prices will involve a sacrifice of monopoly revenue. Moreover, in so far as the slump in the constructional trades is due not to miscalculation but to the inevitable discontinuity of investment (cf. ch. ii. § 3), they seem entitled to special consideration.

basis of experience, than that they will come; and for a financier with large resources and waiting-power there would seem to be no safer and more profitable investment than to buy up all that the furnaces could produce. Yet while short and feverish bursts of speculation are common enough on the warrant market, far-sighted and deliberate bull operations of this character seem to be unknown. And it is, I have been told, almost impossible to borrow in this country on the security of iron, unless held in the public stores. If then either by a clearer realisation of their own future prospects[1] or by the assistance of far-sighted speculators, iron makers could be induced to go on producing for stock, the waste resulting from restriction of production could be obviated, while the restriction of *sale* continued.

But if our analysis is correct, the stocks thus created must be of a peculiar kind. They will be harmful, from our point of view, if they resemble the present iron stores, hanging like a cloud over the market, and lowering prices still further in time of depression: or even if they resemble the suggested Lancashire cotton reserve, their volume contracting or expanding automatically with the rise or fall of market price. The kind of store which we require is one kept upon a mountain out of sight of the market by an omniscient Olympian, who shall regulate prices in time of boom in such a way as to keep the ravages of the investment-bacillus within bounds, and in time of depression in such a way that he neither gains nor loses at the expense of the rest of the community on the whole.

Whether this is a function which corporation or cartel will ever be able to fulfil is a matter of opinion. "It is not sufficient," says the Wisdom of France, "to be philanthropic: it is necessary also to be perspicacious." So far even the philanthropy of the great combinations has not always been above suspicion; and as to perspicacity, their

[1] In this connection the recent unsuccessful proposal, emanating from Messrs. Bolckow and Vaughan, for the formation of a holding and distributing company by the ironmakers of Cleveland, is of some interest (cf. *Ec. Jour.*, Sept., 1913, p. 463).

occasional excursions into benevolence have perhaps been more disastrous than their customary pursuit of self-interest. Yet unless they can fulfil their function in some such manner as that outlined above, they can hardly claim to have solved the problem of industrial fluctuation.

But secondly, the desired end can be obtained by the adoption of a system of discriminatory prices. Since the transport industries happen to be among those in which a certain measure of discrimination is most easily feasible without the danger of invidious personal distinctions, and also among those in which the demand in times of depression is least elastic, this alternative appears to be especially worthy of attention in their case. It may be suggested with due respect that the objection on the part of certain authorities, notably Professor Pigou,[1] to admitting its justification is due to an imperfect appreciation of the importance of the indivisibility of the *initial* unit of investment,—to a reluctance to go far enough back in the search for that jointness of supply which justifies a system of discriminating charges.[2]

[1] *Wealth and Welfare*, Book II. ch. xiii.

[2] For instance, a permanent way built primarily in response to a demand for wheat transport involves the provision of a number of potential units of passenger transport as well, since the energies of the railway are not likely to be entirely absorbed in the carriage of wheat. In the light of this consideration the controversy whether units of transport applied to different objects are properly called homogeneous or heterogeneous seems to me a barren one: the employment of more than a certain number of transport-units in the carriage of wheat will be physically impossible, whether or no the additional units are "homogeneous" with the earlier. But I confess that the distinction seems to me in any case unimportant: nor do I understand why Professor Pigou, having decided (*op. cit.*, p. 211) that "under increasing returns monopoly plus discrimination of the third degree [i.e., between sub-markets the composition of which is not wholly within the monopolist's control] *may* raise output above the competitive amount, and is more likely to do this the more numerous are the markets between which discrimination can be made," concludes on the following page that under increasing returns monopoly plus such discrimination "may, but is *very* unlikely" to yield an output closer to the ideal output than simple competition yields. It appears to me that wherever a very imperfect divisibility of the initial unit of investment prevails, there is a strong prima facie case for discrimination: and that in the railway industry, where the official and non-official facilities for

In so far as monopoly facilitates the adoption of such a system, its claims to provide a remedy for industrial depression are strengthened.

Another method of approaching the whole difficulty is by an artificial elevation of the demand for constructional goods. The proposal of the Minority Report of the Poor Law Commissioners that Government contracts for structural work should be concentrated upon times of bad trade has found favour in many quarters, and seems to be deserving of cordial support.[1]

It must be observed finally that all such proposals for increasing the volume of consumption during depression are, like a steady price level and the more equal distribution of wealth, open to the objection that they will tend to check that accumulation of consumable goods upon which industrial progress depends. How much weight we attach to this objection depends upon more ultimate judgments, and upon the solution which we are prepared to give of the ambiguity latent in the definition at the beginning of § 2. What is meant by the most desirable distribution of the community's income through time? Is the assumption valid upon which western civilisation seems to proceed,

elaborate classification ensure the possibility of forming a large *number* of sub-markets, and where the monopolist's power of determining the *composition* of those sub-markets in accordance with his own interests is by no means negligible (cf. Pigou, *op. cit.*, pp. 222–228), the argument is particularly strong.

[1] Professor Pigou criticises the Commissioners' detailed scheme (*Wealth and Welfare*, pp. 483 ff.) on the ground that it involves introducing unsteadiness into the demand for one group of workers in such wise as to balance unsteadiness of the demand for other groups, and that its efficacy in diminishing unemployment depends therefore on the mobility between groups. In view of the nature of the work projected, which is all (with the exception of afforestation) of the same nature as that required in private industry, I think he over-emphasises the importance of this point. Mr. Hawtrey's attack upon the proposal (*op. cit.*, p. 260) scarcely deserves formal refutation. He asserts that "the Government by the very fact of borrowing for this expenditure is withdrawing from the investment market savings which would otherwise be applied to the creation of capital." The whole point is that in times of depression savings are *not* otherwise so applied.

—that it is desirable so to manipulate one's income-stream that it shall flow in with an ever-rising tide? From some points of view the whole cycle of industrial change presents the appearance of a perpetual immolation of the present upon the altar of the future. During the boom sacrifices are made out of all proportion to the enjoyment over which they will ultimately give command: during the depression enjoyment is denied lest it should debar the possibility of making fresh sacrifices. Out of the welter of industrial dislocation the great permanent riches of the future are generated. How far are we bound to honour the undrawn bills of posterity, and to acquiesce in this never-closing hyperbola of intersecular exchange? Shall we sacrifice ourselves as willing victims to the

> Urge and urge and urge
> Always the procreant urge of the world?

Or shall we listen to the words of one of the wisest of English philosophers, who counsels us to eat our grapes downwards, and who always washed up the knives first in case it should please God to take him before he got to the forks? The question is one of ethics, rather than of economics: but let us at least remember that we belong to an age which is apt to forget the οὗ ἕνεκα among the ὧν ἄνευ οὐ, and immolate ourselves, if we must, with our eyes open and not as in a trance.

TABLES

TABLE I.

Petroleum Output in Millions of Long Tons.

	U.S.A.	Russia.	Dutch Indies.	Galicia.	Roumania.	India.	Mexico.	World's Total.
1899	7·2	8·3	—	·3	—	·1	—	16·8
1900	7·5	9·8	—	·3	·4	·2	—	18·6
1901	8·8	?	·1	·4	·3	·2	—	19·9
1902	11·2	?	·5	·5	·3	·2	—	22·9
1903	12·8	9·8	2·0	·7	·4	·4	—	26·2
1904	14·9	10	·9	·8	·5	·5	—	28·0
1905	17·1 19·0	7·5	1·1	·8	·6	·6	—	27·0 29·9
1906	17·9	8·2	1·2	·7	·6	·6	—	29·8
1907	23·3	8·4	2·2	1·2	1·1	·6	·3	36·4
1908	24·4	7·7	2·3	1·8	1·1	·6	·6	38·7
1909	24·4	8·0	1·5	2·1	1·3	·9	·4	39·2
1910	28·3	9·0	1·7	1·7	1·4	·9	·5	44·2
1911	29·0	9·2	1·7	1·5	1·5	·9	1·0	44·5
1912	29·9	9·2	1·5	1·2	1·8	1·0	2·6	48·1
1913	33·7	9·5	1.5	1·1	1·9	1·1	3·6	53·3

Note.—The estimates since 1905 inclusive are from *The Mineral Industry*, edited by Charles Of, New York, 1911, p. 557; for earlier years they are those of the *Annual British Reports on Mines and Quarries.*

TABLE Ia.

Production of Pennsylvania, etc. (in Barrels).

1902	32·0 m.	1905	29·5 m.
1903	29·9 m.	1906	28·3 m.
1904	31·4 m.		

TABLE II.

English Railways.

(From *Whitaker's Almanacks.*)

	New Railway Mileage.		New Railway Mileage.		New Railway Mileage.		New Railway Mileage.
1846	595	1856	427	1866	565	1876	208
1847	909	1857	387	1867	393	1877	205
1848	1,182	1858	448	1868	449*	1878	256
1849	904	1859	460	1869	449*	1879	363
1850	590	1860	431	1870	392	1880	237
1851	—	1861	436	1871	39	1881	242
1852	—	1862	692	1872	238	1882	282
1852	—	1863	771	1873	268	1883	224
1854	368	1864	467	1874	366	1884	183
1855	226	1865	500	1875	216	1885	—

* Average.

TABLE III.

British Tonnage.

(From *Lloyd's Register*.)

	On Register, January 1.	Broken-up, Wrecked, etc.	Sold Foreign, etc.	Total Diminution.
	100,000 Gross tons.	100,000 Gross tons.	100,000 Gross tons.	100,000 Gross tons.
1887	98·1	3·4	1·5	4·8
1888	98·2	3·0	1·7	4·6
1889	101·0	2·4	1·8	4·3
1890	106·6	3·1	1·9	5·0
1891	111·5	3·3	1·6	4·9
1892	116·6	2·9	1·4	4·3
1893	122·0	2·7	2·5	5·1
1894	124·9	3·1	2·6	5·7
1895	128·3	3·1	4·0	7·1
1896	129·7	3·2	3·7	6·9
1897	131·4	3·3	4·5	7·8
1898	131·6	3·0	6·3	9·3
1899	133·7	2·6	6·3	9·0
1900	137·6	2·7	6·7	9·4
1901	140·3	2·4	4·1	6·5
1902	146·4	1·9	3·2	5·1
1903	153·5	2·6	3·6	6·3
1904	157·7	2·5	3·6	6·1
1905	162·8	2·5	6·2	8·6
1906	166·8	2·4	4·9	7·3
1907	174·6	2·4	4·2	6·6
1908	180·8	2·8	2·7	5·5
1909	182·3	2·7	4·1	6·7
1910	184·0	3·7	5·9	9·6
1911	184·6	2·5	7·7	10·2
1912	188·1	3·5	7·4	11·0
Total	368·7	73·7	104·1	177·7

TABLE IV.

PROPORTION OF VESSELS, REMOVED FOR FOREIGN TRANSFER IN EACH YEAR, BUILT BEFORE—

	1885.	1890.	1895.	1900.	1905.
1896 . .	75	—	—	—	—
1897 . .	70	—	—	—	—
1898 . .	50	66⅔	—	—	—
1899 . .	50	60	—	—	—
1900 . .	38	55	—	—	—
1901 . .	49	57	—	—	—
1902 . .	45	58	—	—	—
1903 . .	59	71	—	—	—
1904 . .	35	55	80	—	—
1905 . .	43	62	78	90⅗	—
1906 . .	36	48	65	80	93
1907 . .	31	51	67	78	90
1908 . .	36	50	65	75	83
1909 . .	27	47	72	81½	?
1910 . .	19	33⅓	73½	85½	95
1911 . .	14	29½	59	81	91
1912 . .	11	25⅖	47	65 7/10	83 7/10

TABLE V.

	Brazilian Coffee Crop (Estimates of "The Grower," quoted in *Economist Histories*).	Brazilian Jute-yarn Imports from United Kingdom (Annual Returns of Trade).		Brazilian Coffee Crop (Estimates of "The Grower," quoted in *Economist Histories*).	Brazilian Jute-yarn Imports from United Kingdom (Annual Returns of Trade).
	Thousand bags.	Million pounds.		Thousand bags.	Million pounds.
1896		16·5	1906	10,277	31·3
1897	—	23·5	1907	19,663	35·0
1898	—	21·4	1908	10,304	24·2
1899	—	20·3	1909	12,419	21·9
1900	8,971	21·1	1910	14,944	25·6
1901	10,250	28·0	1911	10,548	22·0
1902	15,496	31·8	1912	12,464	22·6
1903	12,324	28·0	1913	10,750	14·5
1904	10,407	21·3	1914	?12,500	10·3
1905	9,973	24·7			

TABLE VI.

Building Plans authorised by Urban Districts.

(From Quarterly Returns in the *Labour Gazette*.)

		Dwelling-houses. £100,000	Factories, etc. £100,000.	Shops, etc. £100,000.	Total. £100,000.	No. of Areas.
1909	1					
	2	21·3	2·3	2·2	34·7	90
	3	21·0	3·9	2·6	39·2	91
	4	15·7	2·5	2·9	28·6	92
1910	1	15·7	3·0	1·9	28·8	92
	2	20·3	3·0	3·1	37·0	90
		23·3	4·0	3·7	43·2	99
	3	16·6	3·2	3·5	32·4	91
		17·7	4·1	4·0	36·4	101
	4	14·4	2·9	2·3	27·2	92
		15·4	3·7	2·6	30·6	98
1911	1	16·6	3·6	4·1	33·8	92
		19·7	5·4	4·6	40·9	99
	2	17·4	5·5	4·7	39·7	99
		18·4	5·7	4·8	41·3	100
	3	13·1	4·6	3·7	33·3	101
		13·6	4·7	3·7	34·1	102
	4	13·1	6·0	3·6	34·0	98
		12·8	6·0	3·5	33·3	96
1912	1	15·1	6·8	3·7	34·9	99
	2	14·5	11·2	3·4	40·2	100
	3	12·6	7·5	3·9	34·7	102
		14·4	6·1	3·0	30·4	91
	4	12·8	9·0	2·8	35·2	96
		12·1	7·2	2·8	31·8	93
1913	1	14·1	6·3	3·9	34·9	94
	2	16·4	8·7	4·2	44·5	92
	3	12·0	7·4	4·9	34·7	91
	4	11·3	4·0	2·9	29·6	93
1914	1	17·3	6·6	4·5	39·9	94
	2	18·0	7·1	7·6	45·6	92

TABLE VII.

Analysis of Results of Table VI.

	On Preceding Quarter.			On Corresponding Quarter of Preceding Year.		
	Dwellings.	Factories.	Total.	Dwellings.	Factories.	Total.
1909	3 Fall	Rise	Rise	—	—	—
	4 Fall	Fall	Fall	—	—	—
1910	1 Rise	Rise	Rise	—	—	—
	2 Rise	?Stationary	Rise	Fall	Rise	Rise
	3 Fall	?Stationary	Fall	Fall	Fall	Fall
	4 Fall	Fall	Fall	Fall	Rise	Fall
1911	1 Rise	Rise	Rise	Rise	Rise	Rise
	2 Fall	Rise	Fall	Fall	Rise	Fall
	3 Fall	Fall	Fall	Fall	Rise	Fall
	4 Rise	Rise	Rise	Fall	Rise	Rise
1912	1 ?Rise	Rise	Rise	Fall	Rise	Fall
	2 Fall	Rise	Rise	Fall	Rise	Rise
	3 Fall	Fall	Fall	Fall	Rise	Rise
	4 Rise	Rise	Rise	Rise	Rise	Rise
1913	1 Rise	Fall	Rise	? Rise	? Rise	Rise
	2 Rise	Rise	Rise	Rise	? Fall	Rise
	3 Fall	Fall	Fall	Rise	Rise	Rise
	4 Fall	Fall	Fall	Fall	Fall	Fall
1914	1 Rise	Rise	Rise	Rise	Rise	Rise
	2 Rise	Rise	Rise	Rise	Fall	Rise

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1900.	Pig-iron.	Iron and Steel.	Tin-plate.	Engineering and Metal.	Ship-building	Building.	Furnishing.	Printing.	Paper.	Glass.	Leather.	Boots.	Tailoring. Bespoke.	Tailoring. Ready-made.	Wool, Worsted	Hosiery.	Docks.
Jan. .	381	82,400	418	2·3	2·0	+1·0	+1·6	−0·2	2·4	9·3	1·8	+	Bad	+	4	V. good	+169
Feb. .	383	82,698	418	2·3	2·9	+1·6	+3·9	+0·8	2·3	9·4	1·3	+	,,	+	2	,,	+371
Mar. .	377	+2·3	420	2·2	2·5	+1·0	+1·4	+0·3	2·2	9·3	1·3	+	+	+	3	,,	+1,319
April.	383	−1 2	411	2·4	2·1	+0·9	+9·5	+1·1	2·1	9·0	1·7	Still fairly good	+	+	3	,,	+204
May .	381	−0·6	416	2·3	1·6	+0·6	+0·1	+0·5	2·8	10·1	1·6	−	Fairly good	Good	5	,,	−337
June .	383	+0·5	401	2·5	2·1	+0·5	+0·7	+0·6	3·7	10·2	1·5	−	Fair but−	,,	53	Slight−	+708
July .	377	−15·9	357	2·7	1·8	+0·7	+0·7	0·0	3·5	10·4	2·2	−	−	,,	55	Fairly	+315
Aug. .	372	+6·0	349	2·8	2·1	+0·6	+1·1	−0·3	3·0	9·1	2·1	−	Dull but+	−	67	good	+533
Sept..	360	+9·0	354	2·9	2·4	+0·8	+1·9	−0·9	3·1	9·6	2·0	Still slack	Still dull	−	33	−	+373
Oct. .	345	−2·8	357	2·9	2·6	+1·4	+1·4	+1·0	2·9	9·7	2·2	,,	+	Dull	35	Bad	+1,483
Nov. .	342	−1·6	356	3·4	3·6	+1·8	+1·9	+0·6	2·3	9·5	2·4	+but	Fair	,,	34	,,	+1,742
Dec. .	326	−1·6	324	4·1	3·7	+1·7	+2·0	+0·9	1·4	11·7	2·7	slack	−	−	35	Slack	+1,050
1901.																	
Jan. .	307	0	286	4·1	3·9	+2·0	+1·4	−0·1	1·6	12·2	3·5	+but slack	+but quiet	Slack	33	Slack	+,1720
Feb. .	288	0	277	4·0	3·2	+2·1	+0·5	−0·6	2·6	12·4	2·5	+	Dull	+	29	,,	+2,931
Mar. .	289	+0·5	293	3·5	2·4	+2·1	+1·2	+0·1	3·1	12·7	2·0	Fair	+	+	21	Slack but+	+1,293
April.	291	−2·0	335	3·4	4·5	+1·2	+1·2	+0·0	3·7	11·8	1·8	−	+	+	24	Slack but+	+2,091
May .	300	+2·6	344	3·4	2·3	+1·2	+1·2	+0·8	3·2	11·4	1·8	Fair	Good	+Good	13	+	+2,038
June .	305	−0·9	344	3·3	3·2	+1·3	+1·1	+0·3	2·5	Slight−	1·5	−	,,	−Fair	12	−	+2,038
July .	307	−0·7	347	3·3	3·0	+1·2	+1·5	+0·1	2·8	,,	2·3	−	Quiet	Fair	17	−	+1,784
Aug. .	315	+0·5	349	3·5	3·7	+0·9	+0·5	+0·9	2·7	,,	2·9	−Bad	Dull	−Slack	21	−	+1,497
Sept.	319	−0·5	377	3·5	3·9	+0·8	+0·8	+1·4	2·2	No change	3·0	Bad generally	,,	,,	23	+but slack	+531
Oct. .	313	+2·5	381	3·7	4·2	+1·6	−0·1	+0·1	2·3	−	3·2	,,	+	,,	21	+but slack	−866
Nov.	311	−2·0	393	4·3	4·7	+0·2	0	−0·2	4·1	Slight+	3·3	,,	Dull	+but slack	16	+	−2,492
Dec. .	310	−2·6	378	5·4	5·8	+1·0	−0·9	+0·3	2·5	Slight−	3·6	+but slack	−Bad	−Bad	43	+Good	−1,108

TABLE VIII. (*continued*).

1902.	1 Pig-iron.	2 Iron and Steel.	3 Tin-plate.	4 Engineering and Metal.	5 Ship-building	6 Building.	7 Furnishing.	8 Printing.	9 Paper.	10 Glass.	11 Leather.	12 Boots.	13 Tailoring. Bespoke.	14 Tailoring. Ready-made.	15 Wool, Worsted.	16 Hosiery.	17 Docks.
Jan. .	318	−1·7	385	4·9	4·3	+0·3	+0·3	+1·3	2·4	Slight+	3·8	+ but slack	Dull	+but quiet	43	+	−1,229
Feb. .	315	+1·1	386	4·8	4·7	+0·7	+1·2	+0·8	2·0	No change	3·3	+Fair	+	Fair	23	Good	−1,442
Mar. .	314	−0·3	395	4·1	4·1	−0·6	−0·4	−0·3	1·8	—	2·5	Slack	+	+	8	„	−2,048
April.	316	+0·9	405	4·7	4·7	+0·1	−0·8	0	2·0	No change	2·7	Slack but+	+Good	Fairly good	7	Fairly good	−2,330
May .	321	−2·6	409	4·7	5·7	−0·4	−0·3	−0·5	2·4	—	2·5	—Dull	—	Good	3	Good	−1,363
June .	324	+4·0	398	4·9	6·8	−0·2	+0·3	−0·3	2·4	Slight+	2·8	—	Still good generally	„	2	—but fairly good	−1,552
July .	325	0	399	4·4	5·6	+0·1	+1·1	+0·4	2·2	—	3·6	Bad	Bad	—but fair	12	+	−1,555
Aug. .	327	0	402	4·4	6·3	+0·2	+0·4	−0·5	3·1	Slight+	5·2	Still bad	„	„	8	—but fair	−2,337
Sept..	325	−2·1	395	5·0	9·2	+0·5	+1·1	+0·6	2·4	„	5·6	„	Dull	Quiet	8	„	−795
Oct. .	324	−0·8	402	5·0	10·6	+0·8	+0·4	+0·3	2·2	Slight—	4·6	Slight+ but quiet	+	Fair generally	9	+Fairly good	−1,688
Nov.	324	−3·0	395	5·0	10·7	+0·5	+0·1	+0·4	2·3	No change	7·3	Quiet—	—	„	7	+Good	−829
Dec. .	317	+0·1	387	6·2	11·7	−0·1	−0·3	−1·0	2·2	—	6·5	Slight+ but quiet	Moderate	„	7	Good	−1,329

The figures in column 1 represent furnaces in blast; in column 2 for Jan.–Feb., 1900, number of employees, subsequently the percentage increase in employment calculated by the Board on basis both of number employed and of number of shifts; in column 3 mills at work; in columns 4, 5, 9, 11 the percentage unemployed; in columns 6, 7, 8, 10 the increase or decrease in the unemployed percentage on that of the corresponding month of the previous year; in column 15 the percentage of women employed who were employed in mills not working full time during the month; in column 17 the increase or decrease in the average number employed at the principal London docks and wharfs over that employed in the corresponding month of the previous year. + alone always denotes an improvement, — a diminution of employment.

TABLE VIII. (*continued*).

1907.	1 Pig-iron.	2 Iron and Steel.	3 Tinplate.	4 Engineering.	5 Ship-building.	6 Wool.	7 Worsted.	8 Flax.	9 Jute.	10 Silk.	11 Lace.	12 Hosiery.	13 Tailoring. Bespoke.	14 Tailoring. Ready-made.	15 Felt Hat.	16 Boot.	17 Leather.	18 Paper.	19 Printing.	20 Furnishing.	21 Glass.	22 Pottery.	23 Brick.	24 Docks.
Jan. .	343	+0·2	445	3·2	8·8	−4·4	−1·6	−2·7	−1·0	−2·3	−2·1	−1·4	Bad	+	5·0	−1·6	6·9	Good	−0·8	−0·9	−1·8	Good	Bad	−1 2
Feb. .	343	+0·9	449	2·8	7·5	+1·7	+1·7	+1·4	+1·1	+3·1	+2·4	+1·7	„	+	3·4	+2·4	6·2	„	−1·1	−1·2	+6·5	„	„	+0·2
Mar. .	348	+0·7	443	2·9	7·1	+3·4	+2·8	+4·7	+7·0	+1·3	+1·0	+4·0	„	+	2·0	+2·0	6·0	„	−0·5	−0·7	+1·9	„	„	+2·5
April .	349	+0·7	437	2·8	6·6	+1·2	+1·8	+0·5	+1·6	+2·5	−0·4	+1·9	Good	+	2·1	+0·7	5·8	„	−1·4	−0·4	+1·9	„	„	+1·8
May .	346	−0·4	437	2·9	6·7	+2·5	+1·0	+1·1	−0·6	+0·6	−0·9	−0·2	+	+	2·5	+1·5	5·7	„	−0·7	−0·7	+0·1	„	„	+4·7
June .	347	+0·4	451	3·4	6·4	−0·6	−0·6	+0·2	−0·7	−0·3	−4·2	−3·6	Fair	−	2·6	−6·4	4·1	„	0·0	−0·8	+1·2	„	„	−4·5
July .	347	−1·1	446	3·5	7·2	−2·1	−1·7	−2·4	+1·0	−1·2	−0·8	+0·7	„	+	2·0	−3·4	4·1	„	+0·1	−0·3	−1·9	„	„	−4·1
Aug. .	346	0·0	448	3·8	9·3	+0·6	−0·3	−0·2	−1·0	+0·8	+0·6	+1·1	Mod.	Fair	1·5	+0·3	5·0	„	+0·3	+0·1	−0·6	„	„	−5·6
Sept. .	343	−1·3	449	4·1	11·7	+0·5	+0·9	+0·6	−0·9	+0·4	−0·6	+0·4	„	„	2·0	−1·3	4·5	„	+0·7	+0·1	−5·3	„	„	−4·1
Oct. .	335	−2·5	444	4·5	11·6	+1·8	+0·9	+0·3	+0·4	−0·7	+0·7	+1·5	Quiet	„	2·6	+2·5	4·9	„	0	+0·7	+3·0	„	„	−2·2
Nov. .	330	−3·7	447	4·7	12·8	−1·2	−0·5	−1·6	−0·7	−2·2	−4·1	−1·6	„	„	Dis-pute	−0·5	5·8	„	0	+1·6	+3·3	„	„	−1·8
Dec. .	315	+2·4	436	6·4	14·2	−0·3	+1·1	−4·4	+0·1	+0·9	−3·4	−1·4	Slack	„	3·1	+3·5	7·2	„	+0·2	+2·5	+3·8	—	—	+4·3
1908:																								
Jan. .	305	−2·5	430	5·8	15·2	−6·5	−3·0	−7·0	−1·5	−5·2	−6·1	−1·9	„	„	3·2	−1·5	6·9	„	+0·7	+3·3	−6·1	—	Bad	−4·8
Feb. .	299	−0·6	436	5·9	20·0	+0·8	−1·6	−0·9	+2·0	−2·0	−1·1	−0·2	Bad	„	2·1	+2·2	6·6	„	+1·2	+3·0	+2·4	—	„	−3·4
Mar. .	290	−1·5	430	7·1	21·5	+2·5	−1·3	−3·1	−0·9	+2·5	−1·6	+1·1	Mod.	Slight −	1·7	+0·3	6·8	„	+0·6	+3·7	−4·3	Mod.	„	−6·2
April .	293	−2·8	437	8·6	23·2	+0·3	−0·4	+2·3	+2·2	+0·6	−3·4	+1·0	„	Fair	2·1	+3·5	8·0	„	+1·7	+3·5	−0·4	„	Slack	−6·9
May .	286	−1·6	438	9·5	26·1	−1·5	−3·1	−3·2	+0·1	−0·5	−5·9	−2·0	Fair	+	2·8	−1·3	8·0	„	+1·2	+3·9	+1·4	Slack	„	−7·8
June .	282	−0·6	432	10·5	20·6	−3·7	−0·9	−0·5	−3·4	−0·9	−1·4	−1·1	„	Fair	3·4	−3·0	8·6	„	+0·7	+3·6	−0·1	„	„	−0·2
July .	267	−0·4	446	11·1	22·2	−0·2	−0·8	+2·0	+2·0	−0·2	+2·3	+1·7	„	Slight−	2·6	+1·3	8·7	—	+1·0	+4·7	+0·7	—	„	−0·8
Aug. .	270	+0·6	437	12·0	25·2	+1·1	+0·3	+0·3	−2·0	+1·1	+2·1	+0·2	Quiet	Mod.	2·7	−1·4	7·5	—	+1·3	+4·1	−4·9	Bad	Bad	−1·8
Sept. .	277	+0·2	446	12·2	26·6	+3·0	+3·7	+1·2	−0·7	−0·2	+3·5	+0·3	„	„	3·0	−2·7	8·2	—	+1·3	+4·5	−5·5	—	„	−4·2
Oct. .	287	−0·5	447	12·7	26·3	−0·4	−0·8	+0·9	−1·2	−1·1	+3·6	−2·1	Dull	−	2·9	+0·2	8·5	—	+1·0	+4·6	−2·3	Bad	„	−0·6
Nov. .	289	−1·2	444	13·0	25·2	−3·6	+0·7	+3·0	−1·1	−1·3	+1·2	+1·1	Slack	Slack	4·7	−1·1	8·2	+	+0·9	+3·9	+3·9	„	„	−8·5
Dec. .	290	+0·2	456	14·0	24·7	−2·5	+2·0	+2·7	+0·1	−1·8	+2·1	−2·1	Mod.	„	4·6	+0·1	8·6	Fair	+0·8	+2·8	+1·5	—	„	−10·9

TABLE VIII. (*continued*).

1909.	1 Pig-iron.	2 Iron and Steel.	3 Tinplate.	4 Engineering.	5 Ship-building.	6 Wool.	7 Worsted.	8 Flax.	9 Jute.	10 Silk.	11 Lace.	12 Hosiery.	13 Tailoring. Bespoke.	14 Tailoring. Ready made.	15 Felt Hat.	16 Boot.	17 Leather.	18 Paper.	19 Printing.	20 Furnishing.	21 Glass.	22 Pottery.	23 Brick.	24 Docks.
Jan. .	284	+2·6	448	13·1	23·0	−1·7	−1·1	+1·0	+1·4	+0·9	−2·0	1·2	Slack	+	3·5	+3·4	7·9	Fair	+1·3	+1·0	−2·0	Bad	Bad	−2·5
Feb. .	283	0·0	447	12·8	22·5	+3·7	+0·4	+3·9	+0·7	+0·8	+1·1	+1·8	„	+	3·4	+1·4	7·6	„	+1·0	+0·7	+1·7	„	Slight	+2·7
Mar. .	287	−1·0	445	12·6	22·2	+3·6	+2·5	+0·7	+1·0	+3·8	+1·1	+2·9	Mod.	+	3·4	−0·6	7·1	„	+0·6	+0·1	−2·1	„	+ Bad	+2·2
April .	280	−1·1	438	12·4	23·3	+2·4	+1·3	−0·7	−0·2	+3·0	−0·4	+2·6	Fair	Fair	3·3	+0·5	7·0	„	+0·1	0·0	−2·0	„	+	+8·0
May .	289	+2·2	450	12·5	23·4	+3·3	+2·7	+2·6	+1·2	+0·9	−2·6	+2·5	„	„	4·3	+2·9	5·6	+	+0·3	−1·3	+11·5	„	+	+5·2
June .	291	+1·4	450	12·1	23·6	+1·5	+0·8	+2·0	+0·9	+3·2	−0·4	+0·8	Good	„	2·4	−3·6	4·9	Fair	+0·5	−0·1	−1·2	„	Mod.	+2·6
July .	285	−1·2	446	12·1	23·9	−0·3	−1·6	+0·4	+4·8	0·0	+1·7	+0·7	Mod.	„	1·6	−1·3	4·6	„	+0·4	−1·4	−9·0	„	„	+0·9
Aug. .	293	+2·1	444	11·3	23·3	−1·0	−1·2	−0·4	+0·1	−1·1	+0·2	−1·1	Slack	„	1·5	−1·0	4·1	„+	0·0	−0·7	−9·4	+	„−	+1·4
Sept. .	297	+0·9	453	10·8	22·4	+3·4	+3·7	+3·4	+0·6	+0·5	+0·7	+3·1	Mod.		1·2	−0·4	4·5	„	−0·6	−1·2	+2·8	Bad	Mod.	+10·0
Oct. .	297	+1·2	459	10·3	21·5	+2·2	+0·9	+0·7	−0·1	+10·0	+2·4	+14·4	„	„	1·5	+0·9	4·1	Good	−0·3	−2·0	−4·1	„+	„	+0·7
Nov. .	304	−0·7	466	9·5	19·3	−1·2	0·0	−0·6	−1·3	−0·4	+0·3	+0·5	„	„	2·1	+1·0	3·4	„	−0·7	−0·3	+0·1	Bad	−	+6·3
Dec. .	301	+2·8	471	9·8	16·9	−0·4	+0·4	0·0	−0·7	+0·4	−0·9	−0·5	„	„	3·2	+1·9	5·5	„	−1·5	−1·8	+4·3	„−	Mod.	+9·9

Columns 1–5 as for 1900–2. Columns 6–12, 16 and 21 = increase or decrease in wages-bill of firms making returns on previous months. Columns 15 and 17 = unemployment percentage. Columns 18 and 19 = difference of unemployment percentage from that of same month of previous year. Column 24 = percentage difference from same month of previous year in number employed at principal London docks.

TABLE VIII. (*continued*).

1913.	1 Pig-Iron.	2 Iron and Steel.	3 Tin-plate	4 Engineering.	5 Shipbuilding.	6 Building.	7 Brick.	8 Printing.	9 Furnishing.	10 Leather.	11 Glass.	12 Pottery.	13 Tailoring. Bespoke.	14 Tailoring. Ready-made.	15 Silk.	16 Lace.	17 Hosiery.	18 Felt Hat.	19 Boot.	20 Wool.
July	319	+1·3	433	1·9	2·8	−0·8	0·0	−1·2	−0·6	5·2	−1·2	+0·1	Mod.	Good	+0·4	−1·2	−0·3	1·1	−0·4	
Aug.	322	−1·3	454	1·9	2·9	−0·3	+1·2	−1·1	−0·5	5·2	−0·4	−0·2	,,	,,	−1·2	−0·1	+0·3	1·6	−0·2	−0·8
Sept.	311	−5·1	466	2·2	4·9	+0·4	+0·7	−1·0	−0·5	5·0	−1·7	+2·9	,,	Fair	0·0	+0·5	+0·2	3·6	−1·2	+0·7
Oct.	301	+2·4	465	2·2	3·9	+0·1	−1·6	−0·5	+0·1	5·1	+1·4	−0·8	,,	+	+0·5	+2·4	+0·4	2·8	+0·3	−0·7
Nov.	293	+0·7	480	2·1	2·8	+0·6	−1·7	−0·4	−0·4	4·3	+0·7	+0·5	,,	Mod.	−0·5	−3·6	−0·4	5·6	+0·3	−0·8
Dec.	271	+1·0	468	2·7	3·3	+0·6	−0·6	−1·2	−0·5	5·1	−1·5	−0·3	Fair	Slack	−1·0	−1·3	+0·1	5·4	+0·1	−0·9
1914.																				
Jan.	273	+0·4	473	2·4	2·8	+0·5	+0·1	−0·7	−0·2	6·7	−0·2	−1·1	Mod.	+	+0·6	−0·5	−1·4	5·5	0·0	−0·3
Feb.	275	+0·7	483	2·4	2·2	+1·3	+1·2	−0·6	−0·1	6·0	+2·4	−0·2	,,	+Good	+0·6	+0·2	0·0	4·3	+0·3	+0·4
Mar.	278	−2·3	472	2·4	1·9	+0·8	+0·5	−1·4	−0·7	7·0	+1·1	+0·3	Fair	Good	+0·8	+0·6	+0·5	5·2	+0·3	+0·8
April	268	−2·8	468	2·5	2·4	−0·1	+0·2	−0·4	0·0	6·7	−3·6	−0·4	Good	,,	−1·1	−0·3	+1·0	4·8	0·0	−0·6
May	268	+0·3	483	2·7	3·9	−0·7	+1·4	−0·2	0·0	5·0	+5·4	+0·4	,,	,,	+0·2	−1·6	+0·2	3·4	+0·5	+0·1
June	265	−0·0	455	3 0	4·4	−0·4	+1·2	−0·6	+0·1	4·7	−1·0	+0·4	−	−	+0·6	−0·6	0·0	3·0	−0·2	−1·0

1=number of furnaces in blast. 2=increase in aggregate shifts worked on preceding month. 3=number of mills working. 4, 5, 10, 18=Trade Union unemployed percentage. 6, 8, 9=increase in unemployed percentage. 7=percentage increase in number employed by employers reporting, on corresponding month of preceding year. 11, 12, 15, 16, 17 and 19=percentage increase in number employed by employers reporting, on preceding month.

TABLE IX.

New York State. Unemployed Percentages.

(From *Labour Gazette*.)

	Clothing.	Wood-working and Furniture.	Printing, Book-binding, etc.	Building, Stone-working, etc.	Metal Engineering and Ship-building.
June, 1907	7·8	15·9	4·0	9·7	2·5
Sept., 1907	10·0	9·0	5·3	12·7	6·2
Dec., 1907	41·1	26·2	6·1	40·9	28·8
Mar., 1908	46·2	29·3	14·5	54·8	29·5
May, 1908	49·3	35·6	17·8	37·1	32·3
June, 1908	45·4	35·0	17·3	35·1	29·0
Sept., 1908	29·5	19·6	10·4	32·2	22·1
Nov., 1908	21·2	19·6	10·6	35·4	18·7
Dec., 1908	16·3	20·2	12·1	43·0	18·5
Mar., 1909	11·8	15·9	6·5	34·9	15·9
June, 1909	22·1	12·6	9·1	19·1	11·0
Sept., 1909	14·6	8·8	3·7	12·4	6·3
Nov., 1909	15·0	6·1	4·4	17·2	5·0
Dec., 1909	20·9	9·3	6·4	23·9	6·3
Mar., 1910	15·9	13·2	5·0	22·1	4·0
May, 1910	31·5	10·3	4·2	15·9	2·9
June. 1910	28·0	5·3	3·9	15·5	3·3
Sept., 1910	17·1	7·5	4·8	9·6	4·8
Nov., 1910	28·6	7·6	0·6	19·9	5·5
Dec., 1910	47·8	14·8	1·1	29·1	6·6
Mar., 1911	16·6	15·3	3·6	38·3	12·4
May, 1911	38·5	17·1	3·3	28·5	9·3
June, 1911	20·7	11·6	1·2	26·1	12·4
Sept., 1911	9·2	12·7	3·7	13·1	12·2
Nov., 1911	28·5	16·6	3·5	23·1	14·7
Dec., 1911	59·7	18·9	3·6	31·9	15·1
Mar., 1912	15·6	16·8	7·1	35·5	7·2
May, 1912	38·0	17·0	1·8	18·0	9·0
June, 1912	51·9	17·8	3·1	13·6	8·9
Sept., 1912	7·1	6·1	5·8	5·8	3·7
Dec., 1912	58·9	17·8	0·0	18·8	8·1
Mar., 1913	14·0	13·6	6·1	25·1	5·2
May, 1913	40·4	17·1	3·7	15·5	6·7
June, 1913	36·4	14·6	3·4	20·3	4·5
Sept., 1913	25·2	9·3	3·3	16·7	5·0
Nov., 1913	46·1	22·8	4·7	26·7	7·4
Dec., 1913	66·2	23·4	6·8	39·4	14·2

CHART I.—U.K. IRON AND COAL TRADES.

		Base-line.	
1.	Pig-iron production, 1=1m. tons	0	
2.	Coal production, 1=20m. tons	0	
3.	Pig-iron price, B. of T. Index, 1=20	0	1900=100
4.	Coal price, B. of T. Index, 1=20	0	
5.	Iron and Steel Exports to U.S.A., 1=200,000 tons	10	

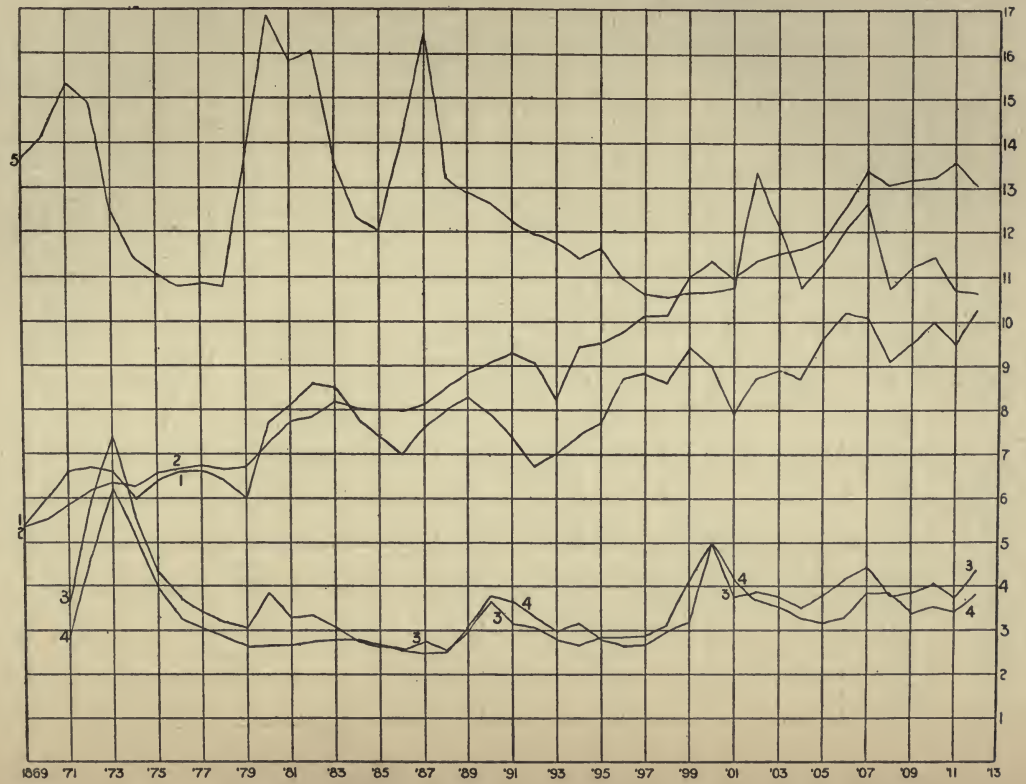


Chart II.—U.S.A. CONSTRUCTION.

1. Pig-iron production, 1 = 2 in long tons.
2. Pig-iron price (No. 1 Foundry, Philadelphia), 1 = $2.
3. Coal price—Index, 1 = 10.
4. Brick price—Index, 1 = 10. Base-line, 0.
5. Building materials price—Index, 1 = 10.
6. Furniture price—Index, 1 = 10.
7. Number of immigrants, 1 = 200,000.
8. New railway mileage, 1 = 2,000 miles.

(Calendar years till 1889; years ending June 30 from 1890).

Note.—The indices 1890–1911 are those of the Bulletin of the Bureau of Labour, March, 1912 (average 1890–9 = 100). Curve 3, 1869–91, is the Aldrich Report Index (1860 = 100). Curves 4 and 5, 1885–9, are the same in terms of the Bureau of Labour Index, on the assumption that the prices of 1890 correspond. Curve 6, 1885–91, is the Aldrich Index for all house-furnishing goods.

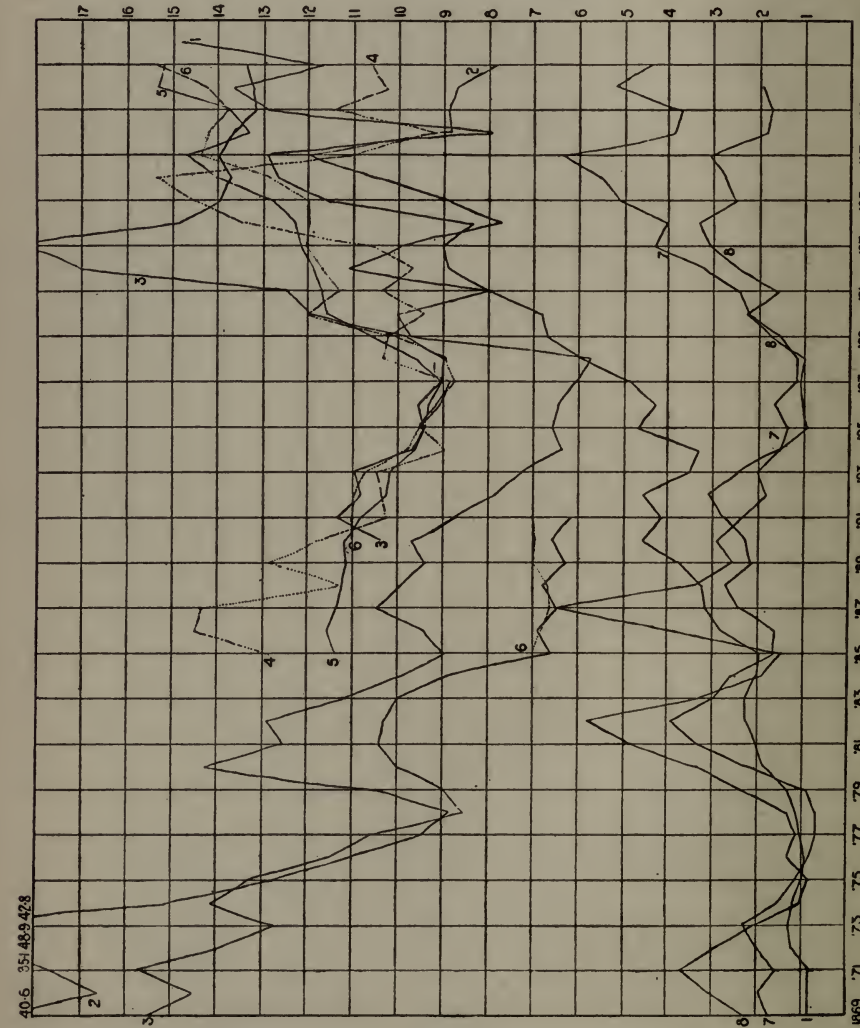


CHART III.—STEEL TRUST CONTRACTS.

1. Average monthly price of pig-iron. Index, July, 1897 = 100. 1 = 20. Base-line – 5.
2. Increase or decrease in Unfilled Contracts on Corporation's books during each quarter, 1 = 600,000 tons. Zero line, 7. (July–Dec., 1910, during each month.)

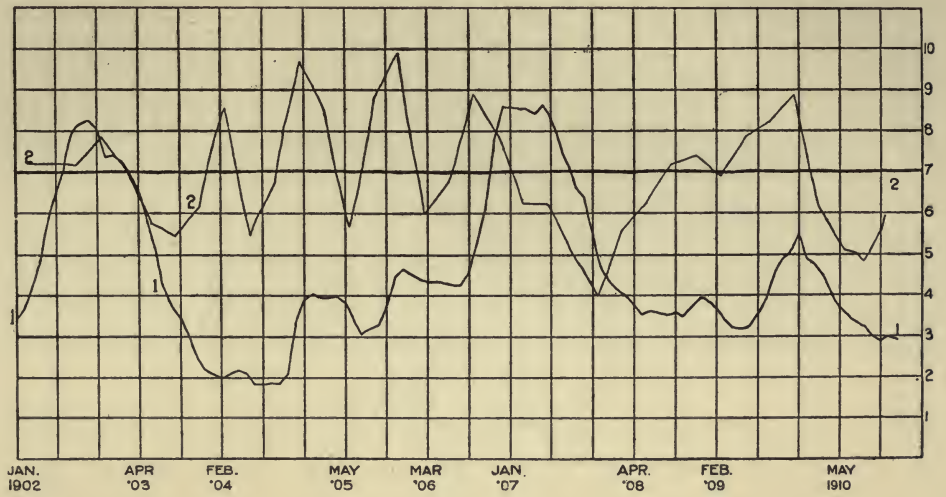


Chart IV.—WHEAT.

1. U.K. Wheat crop
2. French Wheat crop
3. Russian Wheat crop
4. U.S.A. Wheat crop[1]

} 1 = 10 million quarters.

5. U.K., yield per acre
6. France, yield per acre

} 1 = 2 bushels.

7. U.S.A., yield per acre, 1 = 1 bushel.
8. World's Wheat crop, 1 = 50 million quarters.

[1] Mainly commercial estimates from 1891 onwards.

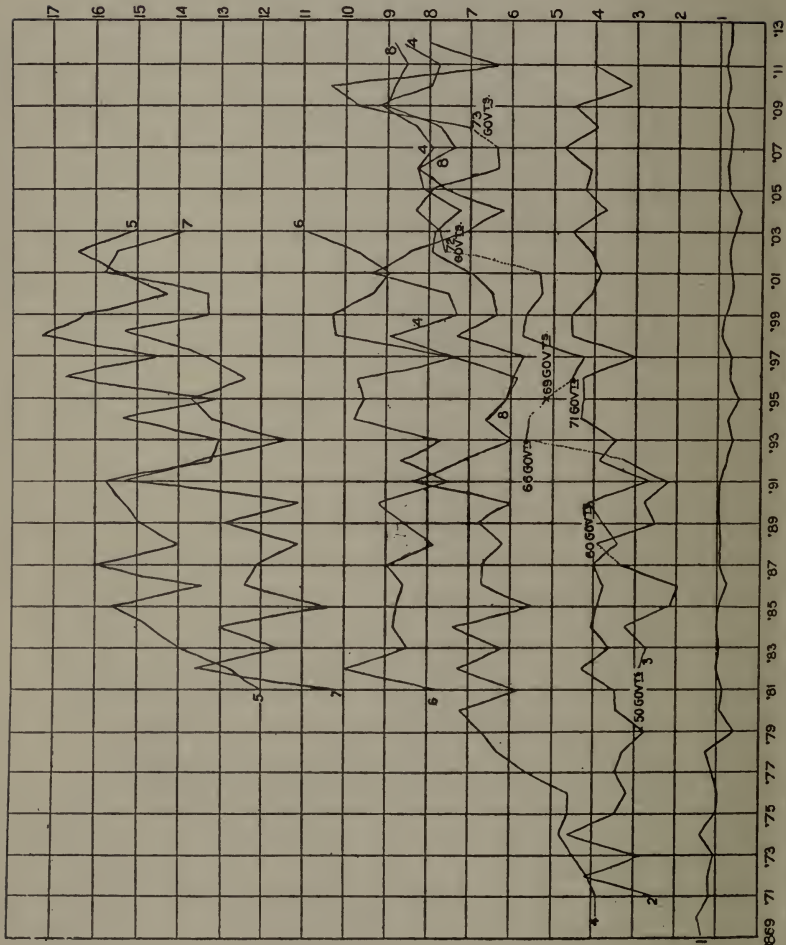
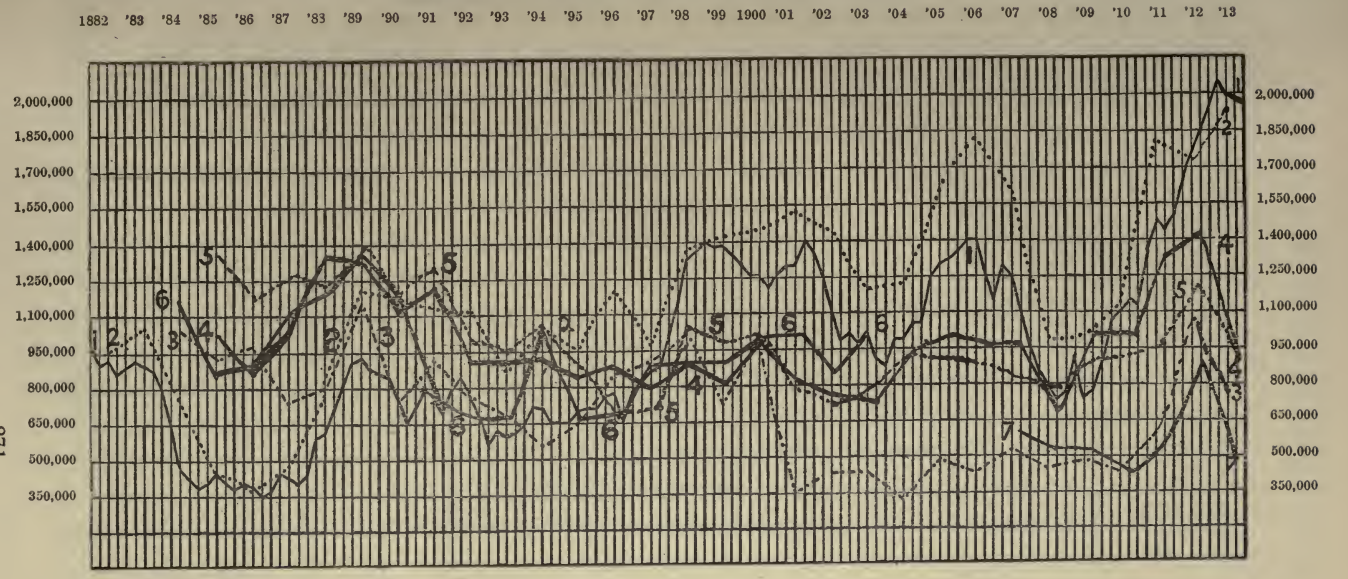


Chart V. Shipping and Shipbuilding.



Explanation.

1. Gross tonnage under construction at end of quarter
2. Gross tonnage launched in year [1] } Scale as at side.
3. Grain freights, New York to London, Board of Trade Index, Cd–2337 of 1904. The figures (from New York Produce Exchange) are in *Stat. Abs. U.S.A.*, whence I have calculated the index since 1903.
4. Grain freights from Odessa, 1885–1903, Board of Trade Index. 1903–13 figures for December of each year from Shipping Trade Year Book, expressed in terms of Board of Trade Index, i.e., taking January 1900, as 100. The series however are not properly comparable, for the figure for January, 1900, is a minimum.
5. 1885–1903. Rice from Rice ports, Board of Trade Index. 1903–12, Rice from Rangoon, figures from Shipping Trade Year Book, expressed in terms of former series, i.e., taking December, 1903, figure as 78.
6. Machinery to the Plate, Board of Trade Index. Scale for Indices, 1,000,000 = 100. Base year, 1900.
7. Homeward grain-freights from the Plate (Shipping Trade Year Book). Scale 40,000 = 1/– per ton cont.

[1] From 1882 to 1888 only that classed by *Lloyd's Register*, estimated at 85 to 90 per cent. of the whole.

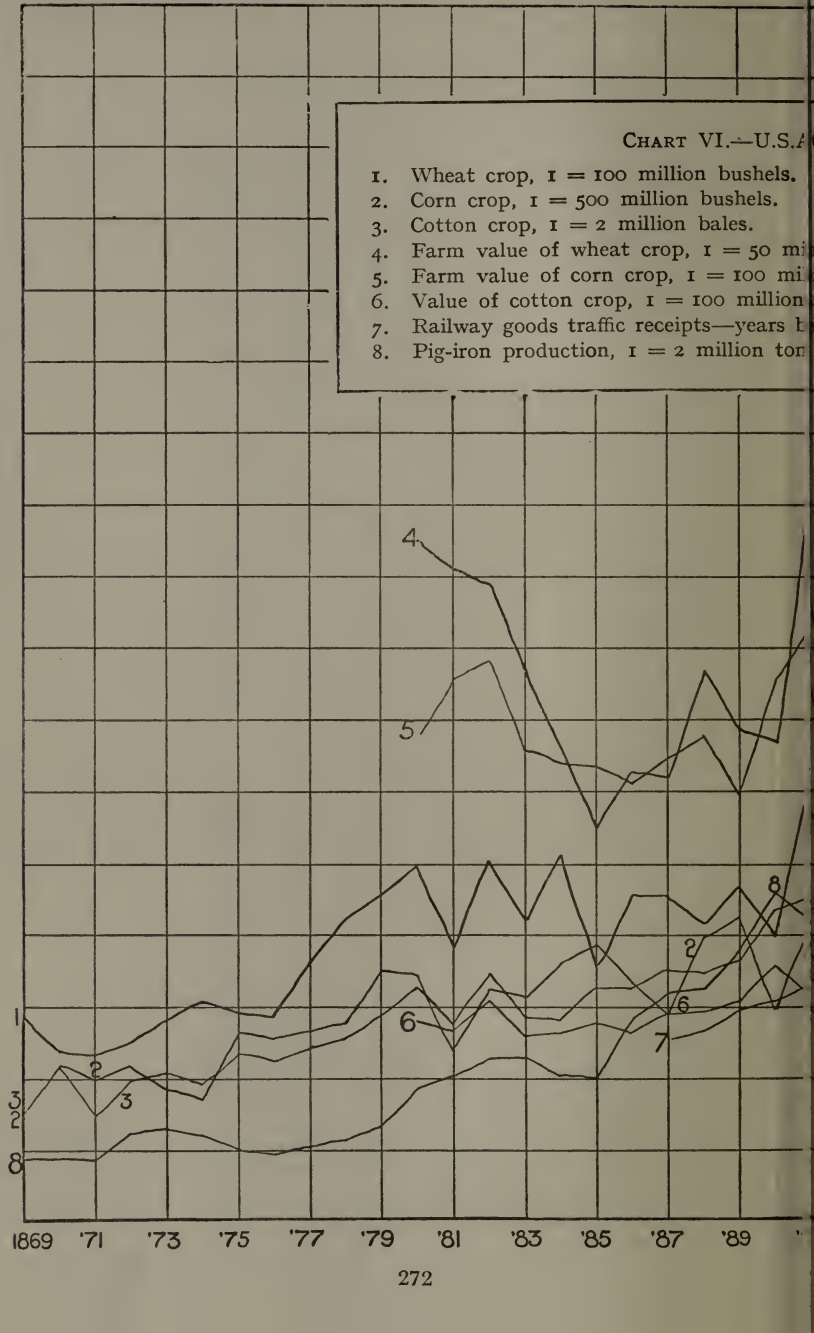
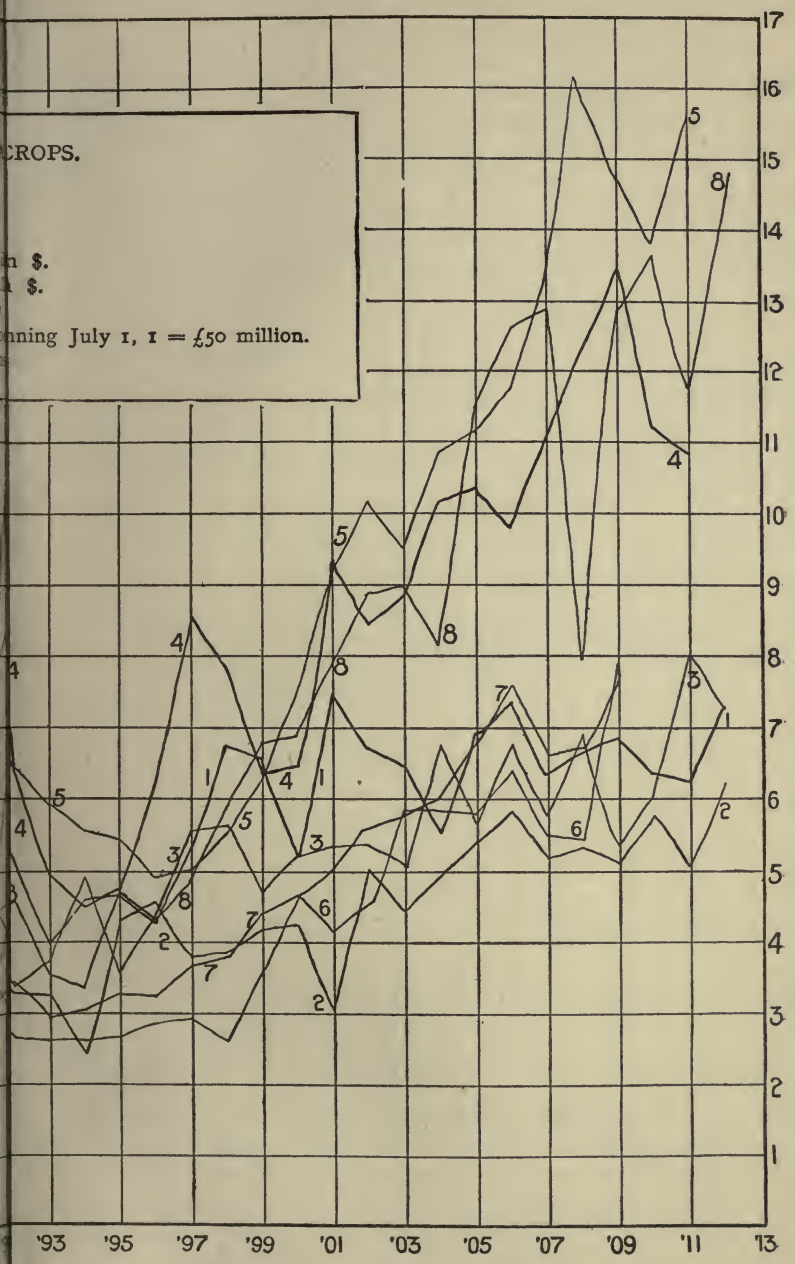


CHART VI.—U.S.A
1. Wheat crop, 1 = 100 million bushels.
2. Corn crop, 1 = 500 million bushels.
3. Cotton crop, 1 = 2 million bales.
4. Farm value of wheat crop, 1 = 50 mi
5. Farm value of corn crop, 1 = 100 mi
6. Value of cotton crop, 1 = 100 million
7. Railway goods traffic receipts—years b
8. Pig-iron production, 1 = 2 million ton
4
5
1
2
3
6
7
8
1869 '71 '73 '75 '77 '79 '81 '83 '85 '87 '89


CROPS.
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nning July 1, 1 = £50 million.
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'01
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'09
'11
'13

CHART VII.—ARGENTINA.

1. Wheat crop, 1 = 2 million quarters.
2. Maize crop, 1 = 2 million quarters. Base-line, 0.
3. Iron and Steel imports from U.K., 1 = 50,000 tons.

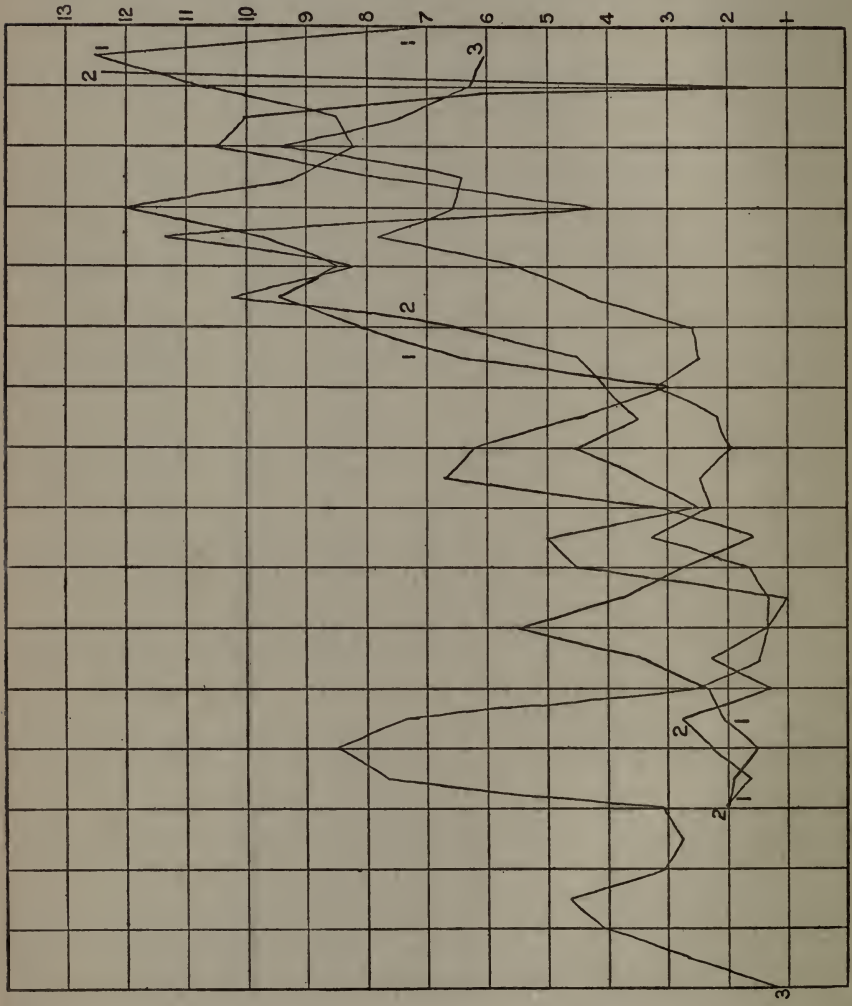
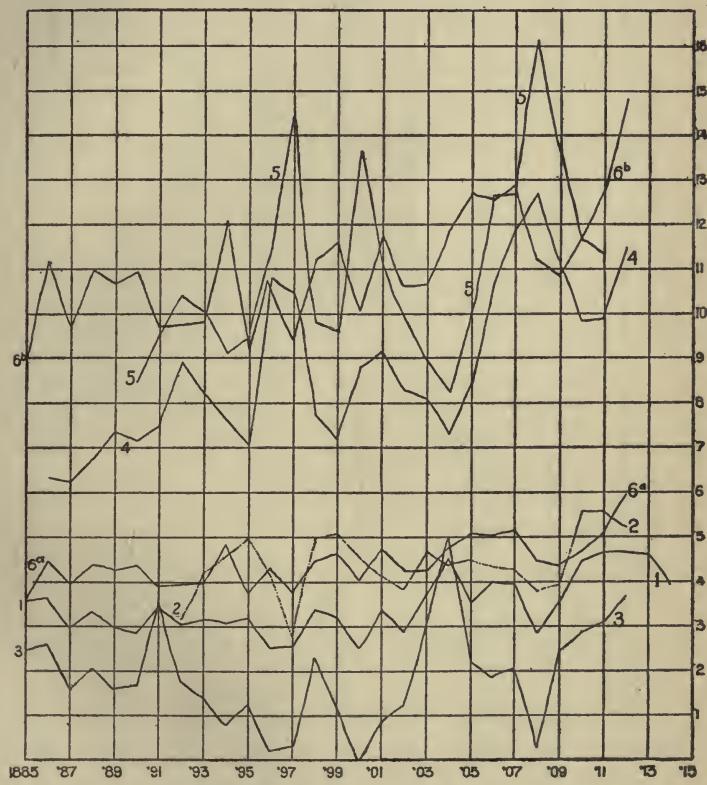


CHART VIII.—INDIA.

1. Wheat production, 1 = 10 million quarters.
2. Rice production, 1 = 100 million cwts.
3. Wheat exports, 1 = 2 million quarters (year beginning April 1).
4. Rice price—Index, 1 = 20. } { 1873 = 100.
5. Average price of seven chief food-grains—Index, 1 = 20 } { 1873 = 700.
6. Cotton piece-goods Imports from U.K.
   a. 1 = 500 million yards.
   b. 1 = 200 million yards.



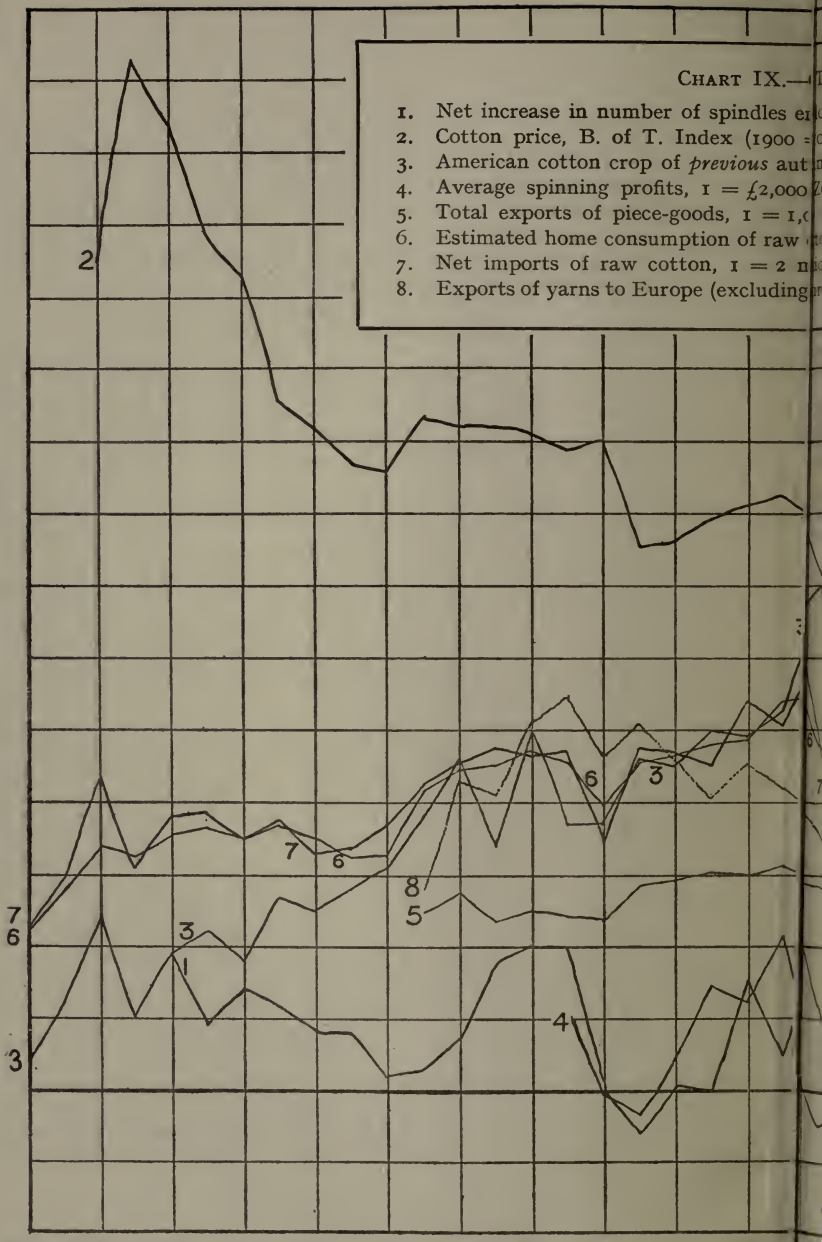


CHART IX.—
1. Net increase in number of spindles e
2. Cotton price, B. of T. Index (1900 =
3. American cotton crop of *previous* aut
4. Average spinning profits, 1 = £2,000
5. Total exports of piece-goods, 1 = 1,
6. Estimated home consumption of raw
7. Net imports of raw cotton, 1 = 2 n
8. Exports of yarns to Europe (excluding
2
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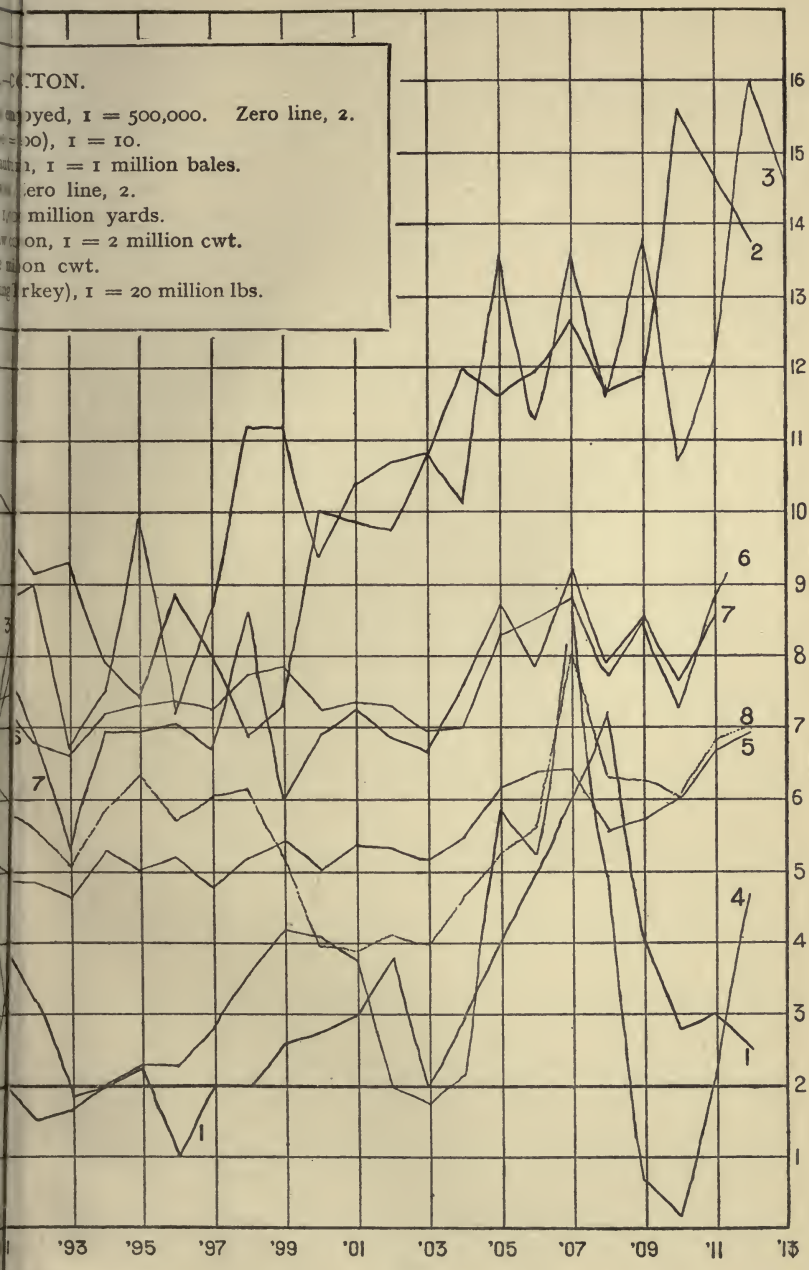
TON.
yed, 1 = 500,000. Zero line, 2.
oo), 1 = 10.
1, 1 = 1 million bales.
ero line, 2.
million yards.
on, 1 = 2 million cwt.
on cwt.
rkey), 1 = 20 million lbs.
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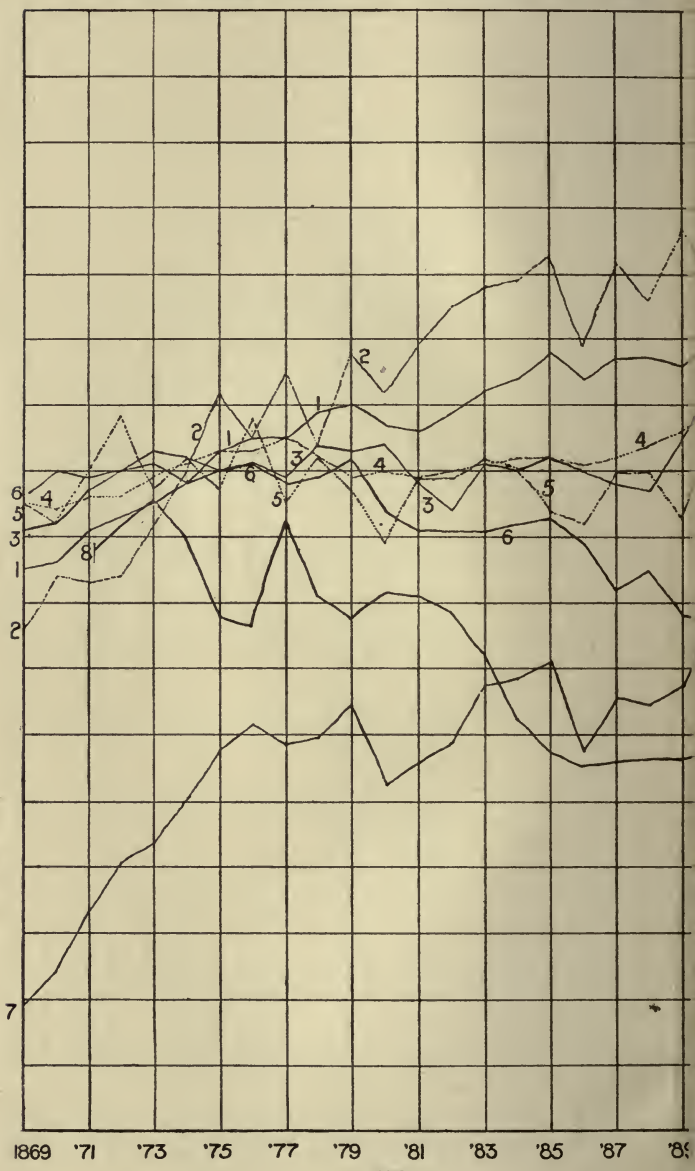
'09
'11
'13

Indices, 1 = 10. Base-line 0. For 1869–96, average 1870–9
1 = Tea. 2 = Sugar. 3 = Meat. 4 = Tobacco. 5 = Cur
7 = Unweighted average, 1 = 20. Base-line — 25. For 1
8. Price of foreign wheat, B. of T. Index (1900 = 100).



)D CONSUMPTION.

For 1896–1912, average 1896–1905 = 100.

Raisins. 6 = Coffee.

verage 1870–9 = 600. For 1896–1912, average 1896–1905 = 600.

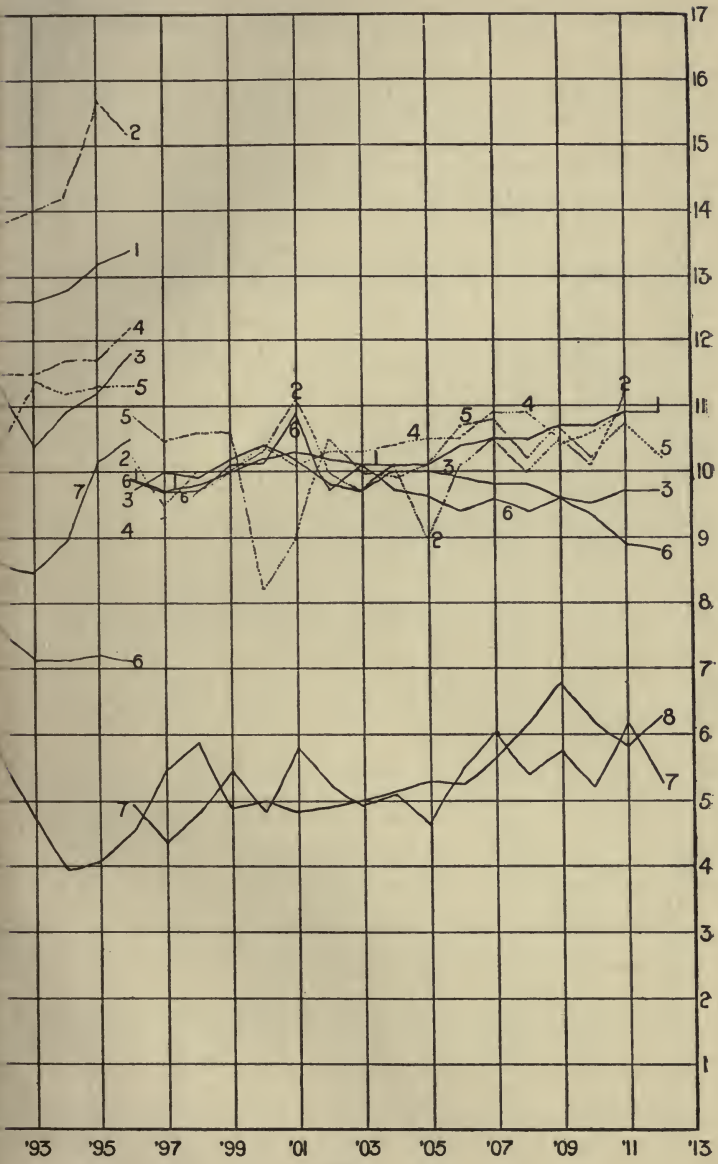


Chart XI.—U.K. Alcohol Consumption.

Indices, 1 = 10. Base-line 0. For 1869–96, average 1870–9 = 100.
For 1896–1912, average 1896–1905 = 100.

1. Wine. 2. Spirits. 3. Beer.
4. Average beer weighted double. For 1869–96, average 1870–9 = 400.
For 1896–1912, average 1896–1912 = 400.
1 = 20. Base-line — 15.
5. B. of T. *Employment* percentage, 1 = 2. Base-line — 44.

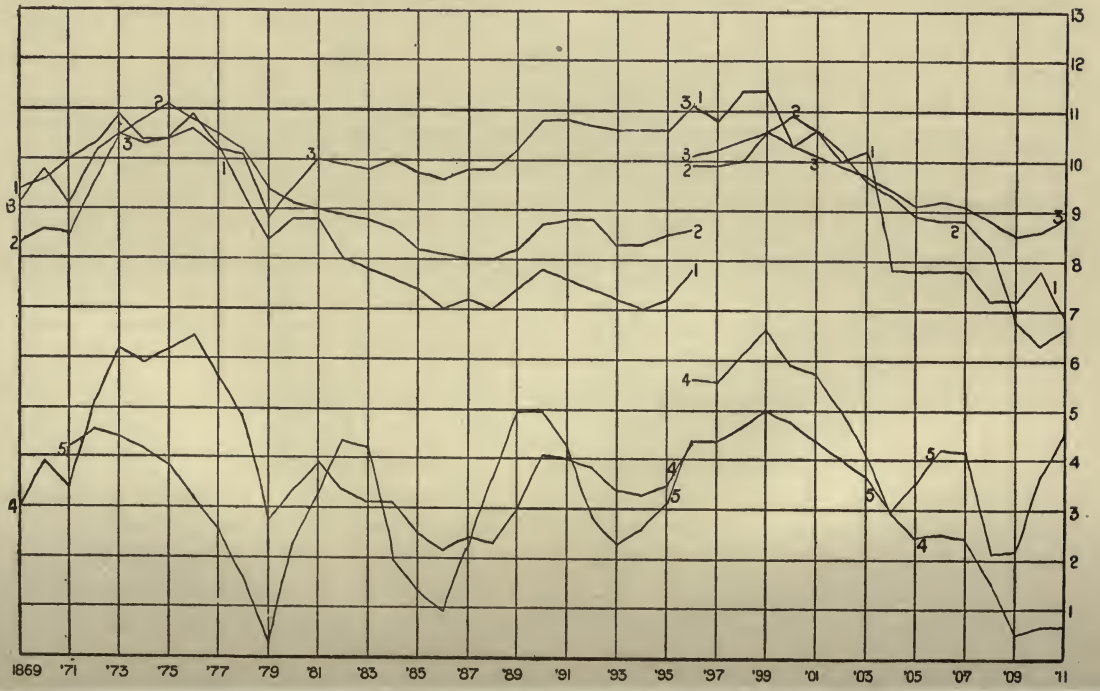


Chart XII.—U.S.A. CONSUMPTION.

1. Per capita consumption of coffee, 1 = 1 lb.
2. Per capita consumption of sugar, 1 = 10 lbs.
3. Home production of sugar, 1 = 200 million lbs.
4. Average export price of corn per lb. 1 = 10 cents.
5. Consumption of pig-iron, 1 = 500,000 tons.
6. Consumption per capita of liquor, 1 = 2 gallons.

Years ending June 30.

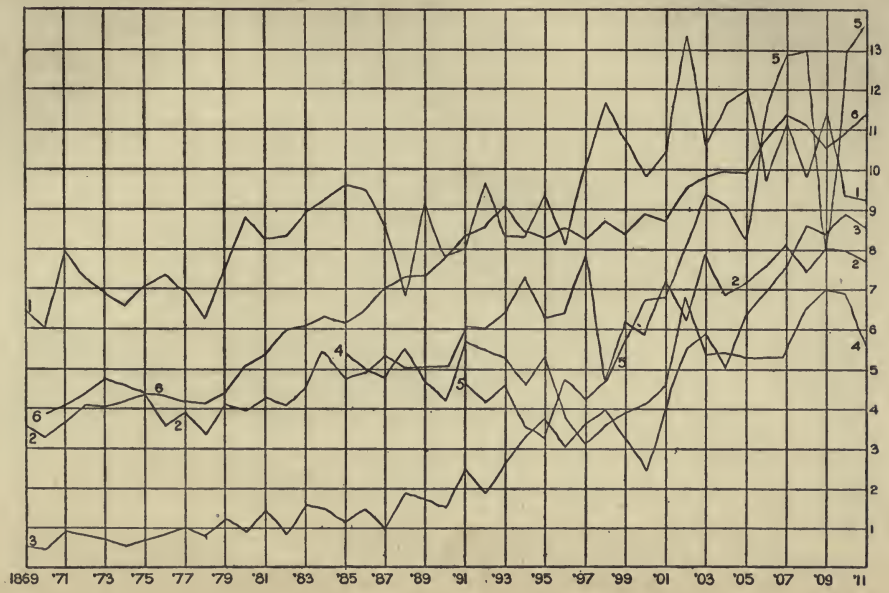
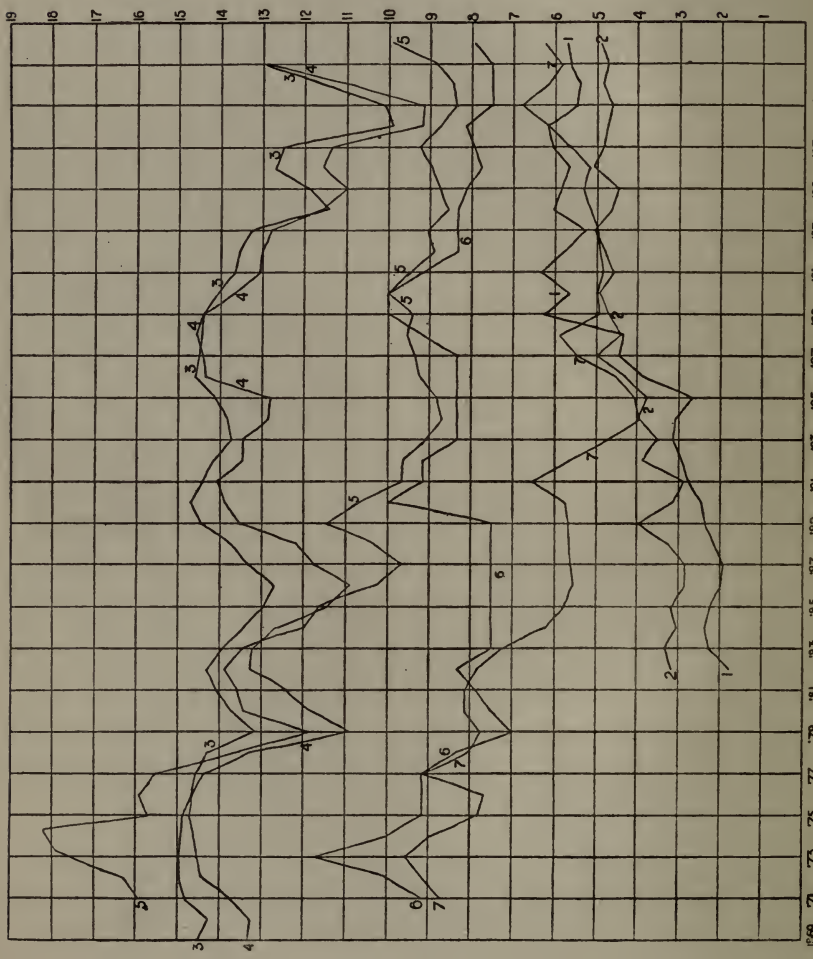


Chart XIII.—U.K. BUILDING TRADE.

1. Imports of furniture woods, 1 = 50,000 tons.
2. Imports of other woods, 1 = 2 million loads.
3. Furnishing Trades Association, percentage *employed*, 1 = 1. Base-line – 85.
4. Amalgamated Carpenters and Joiners, percentage *employed*, 1 = 1. Base-line – 85.
5. Price of timber (hewn fir), B. of T. Index, 1 = 10.
6. Price of bricks, B. of T. Index, 1 = 10.
7. Price of foreign wheat, B. of T. Index, 1 = 20.



INDEX

I. TRADES.

II. AUTHORS.

III. COUNTRIES.

IV. GENERAL.

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