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PRICES AND PRODUCTION

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BY

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WITH A FOREWORD BY

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FOREWORD

THE pure theory of economic equilibrium, the great achievement of nineteenth century Economics, provides no explanation of trade depression. It explains the tendencies conducive to stability in the economic system. It explains the forces making for readjustment in the face of external change. But it does not explain the occurrence of periodic disequilibrium. It does not exclude the possibility of fluctuations in the sense of orderly adaptations. But it does not explain the existence within the economic system of tendencies conducive to disproportionate development. It does not explain the existence of tendencies which conduce to movement *away* from the "ideal" equilibrium.

To explain these tendencies it is therefore necessary to invoke factors not contemplated by this theory. It is necessary to show the existence within the economic system of factors whose operation is not taken into account by the pure theory of equilibrium. Of these factors, the most conspicuous are fluctuations in the volume or the "efficiency" of the prevailing means of payment—"monetary factors" as it is customary to call them. It is almost axiomatic that fluctuations in the volume or the "efficiency" of money must complicate the operation of the equilibrating tendencies.

In the pure theory of equilibrium, the spending power in the hands of spenders is made available by the general process of production. Money which is free to be spent on commodities has been released by the production of other commodities. Incomes fluctuate with the value of marginal net products. In such circumstances it is difficult to see how general disequilibrium can arise. But if spending power is varied, either by the operation of state printing presses or by the credit-creating manipulations of central banks, a new situation is created. Some spending power is now available which has not been released by the production of other commodities. The forces mirrored in the equations of equilibrium no longer alone determine the money receipts of producers. A guarantee that equilibrium will be preserved is no longer given.

Here, then, is the clue which is the rational basis of all attempts to provide a monetary explanation of cyclical fluctuation. Unfortunately, hitherto, as Dr. Hayek has shown,¹ the majority of such attempts have not been successful. Misled by a preoccupation with the *value* of money, they have concentrated only on the causes and effects of changes in the so-called general level of prices, to the exclusion of the more fundamental problem of the effects of changes in the *supply* of money. In so doing, they have failed completely to produce a theory which explains those changes in the "real" structure of production which are the

¹ See Lecture I below, and *Geldtheorie und Konjunkturtheorie*, Chapters II and III.

most characteristic feature of trade fluctuation as we know it. In short, the monetary theories have been too monetary. They have treated fluctuations in monetary factors as merely general and superficial phenomena. They have totally failed to bring the theory of money into harmony with the theory of production.

But there is one group of monetary theories which is immune from these strictures. The School of Vienna, which in recent years, under the leadership of Professor Mayer and Professor Mises, has experienced such a marvellous renaissance, has laid the scientific world under yet another lasting obligation. Working on the basis of the Böhm-Bawerkian theory of capital and the Wicksellian theory of divergences between money and equilibrium rates of interest, Professor Mises and Dr. Hayek have advanced theories which, though they fall into the general category of monetary explanations, yet seem altogether free from those deficiencies which have marked monetary explanations in general. They explain the effects of fluctuations in the supply of money not so much in terms of fluctuations of the general price level as in terms of fluctuations of relative prices and the consequent effects on what may be called the "time-structure" of production. In this way they succeed in reconciling the facts of the credit system as explained by, say, Mr. R. G. Hawtrey with the "real" disproportionalities of the trade cycle as observed by such writers as Cassel and Spiethoff.

I do not think that in the past these theories

have received sufficient attention in this country. Böhm-Bawerk is translated¹ but seldom read. (It is commonly thought, I believe, that Marshall disposed of him in a footnote²). Wicksell was almost unheard of until the other day; even now, the existence of his *magnum opus*, the *Vorlesungen über Nationalökonomie* (which is much later in time and much more refined in theory than the suddenly celebrated *Geldzins und Güterpreise*) has yet to be discovered. And, outside the *alumni* of one institution, I doubt whether half-a-dozen people in the country have read Professor Mises' monumental treatise on Money which, since 1912, has explained to first-year students on the Continent the notions of "forced saving" and money rates of interest out of harmony with equilibrium rates—not to mention all that is true in the "purchasing power parity" theory of the foreign exchanges and a host of other good things which have since been rediscovered by others. I hope that the publication of Dr. Hayek's Lectures, which stand in the midstream of this great tradition, will do something to persuade English readers that here is a school of thought which can only be neglected at the cost of losing contact with what may prove to be one of the most fruitful scientific developments of our age.

¹ Unfortunately only in the first edition. The fourth edition, with its new volume of critical excursions, probably the most remarkable feat of dialectics in the whole literature of Economic Theory, is still inaccessible to those English-speaking economists who do not think it worth while learning German.

² I am sure that this belief was not held by Marshall.

On the actual lectures, it would be otiose for me to expatiate. They speak for themselves. Good wine needs no bush, and Dr. Hayek provides a vintage over which all true economists will linger long. I can only say that for profound theoretical insight and power to open up totally new horizons, I know only one work of its kind which has been published in English since the war with which they can be compared—Mr. Dennis Robertson's *Banking Policy and the Price Level*. English-speaking readers will know that one could give no higher praise. I would not urge that Dr. Hayek has solved all the riddles of cyclical fluctuation. I am sure that Dr. Hayek himself would be the first to repudiate such a suggestion. But I do think he has advanced considerations which any future work on this problem will have to take very seriously into account.

As to the practical implications of his theories, Dr. Hayek, in the true scientific spirit, makes very modest claims. He does not claim to provide a cut and dried cure for all the evils of the monetary system. Indeed, he goes out of his way repeatedly to disavow any intention of providing positive recommendations for practice, claiming only that what he has to say may serve to make us more sceptical of the facile proposals for reform which are generally prevalent nowadays. Nonetheless, it is difficult to deny all *interpretive* value to his contribution. I am bound to say that it seems to me to fit certain facts of the American slump better than any other explanation I know. And I cannot think that it is altogether an accident that the Austrian

Institut für Konjunkturforschung, of which Dr. Hayek is director, was one of the very few bodies of its kind which, in the spring of 1929, predicted a setback in America with injurious repercussions on European conditions. Most monetary theorists seem to have failed utterly to apprehend correctly the nature of the forces operative in America before the coming of depression, thinking apparently that the relative stability of the price level indicated a state of affairs necessarily free from injurious monetary influences. The Austrian theory, of which Dr. Hayek is such a distinguished exponent, can claim at least this merit, that no one who really understood its principal tenets could have cherished for a moment such vain delusions.

LIONEL ROBBINS

London School of Economics.

June, 1931.

PREFACE

WHILE the more naive forms of inflationism are sufficiently discredited today not to do much harm in the near future, contemporary economic thought is so much permeated by an inflationism of a subtler kind that it is to be feared that for some time we shall still have to endure the consequences of a good deal of dangerous tampering with currency and credit. It is my belief that some even of those doctrines which are generally accepted in this field have no other basis than an uncritical application to the problems of society in general of the experience of the individual, that what he needs is more money. In what follows, one of my tasks will be to attempt to demonstrate that the cry for an "elastic" currency which expands or contracts with every fluctuation of "demand" is based on a serious error of reasoning.

The following lectures owe their present form to a generous invitation from the Senate of the University of London to deliver four lectures in advanced Economics during the academic year 1930-31. They are partly a restatement and mainly an extension of theories which I have outlined during the last three years in a book and two periodical articles published in German.¹

¹ *Geldtheorie und Konjunkturtheorie*, Vienna, 1929. "Das intertemporale Gleichgewichtssystem der Preise und die Bewegung des Geldwertes," *Weltwirtschaftliches Archiv*., vol. XXVIII, 1929. "Gibt es einen 'Widersinn des Sparens'?" *Zeitschrift für Nationalökonomie*, vol. I, 1930.

The selection of the particular problem which is here discussed from the larger field which these publications cover, was dictated by the impression that the Anglo-American literature on this subject is deficient in certain leading notions which on the European Continent and in Scandinavia—probably on account of the greater influence of Böhm-Bawerk in those parts—have been more explored, and whose use has proved very fruitful. I have, accordingly, confined myself to those topics which I believe to be unduly neglected in most English and American works on the same subject—topics which seem to be neglected even in the most recent work on this subject, Mr. J. M. Keynes' highly stimulating *Treatise on Money*, which came into my hands only when these lectures were almost completed, too late for me to make the frequent references to it which otherwise would have been desirable. I hope that by emphasising these neglected points I have succeeded indirectly in demonstrating the defects of certain theories which have been very prominent in recent years, and in exhibiting some of the dangers of the remedies for various social ills proposed by their protagonists.

In particular, it is my hope that the analysis of the working of the price mechanism during a transition to more or less capitalistic methods of production, which is attempted in the third lecture, will fill a gap, the existence of which in the past has undoubtedly made the whole line of approach here adopted less convincing than otherwise it might have been. I am less confident

in regard to the last lecture. The territory into which it makes a few tentative steps is little explored and particularly difficult. I can only repeat here what I insist upon in that lecture, that I am profoundly convinced that we are yet very far from the day when our knowledge of these problems will be sufficient to justify any drastic changes in the traditional monetary policy.

I should like to take this opportunity of expressing my gratitude to Mr. Albert G. Hart who gave me the benefit of his advice when I was drafting the original English manuscript of these lectures. My chief obligation, however, is to Professor Lionel Robbins, to whom I am indebted for the very considerable labour of putting the manuscript into a form fit for publication, and seeing it finally through the press.

F. A. HAYEK.

LECTURE I

THEORIES OF THE INFLUENCE OF MONEY ON PRICES

"He realised well that the abundance of money makes everything dear, but he did not analyse how that takes place. The great difficulty of this analysis consists in discovering by what path and in what proportion the increase of money raises the price of things."

RICHARD CANTILLON (died. 1734),

Essai sur la nature du commerce en général, II, 6.

(I) THAT monetary influences play a dominant rôle in determining both the volume and direction of production is a truth which is probably more familiar to the present generation than to any which have gone before. The experiences of the war- and post-war-inflation, and of the return to the gold standard, particularly where, as in Great Britain, it was accomplished by a contraction of the circulation, have given abundant evidence of the dependence on money of every productive activity. The widespread discussions of recent years concerning the desirability and practicability of stabilizing the value of money, are due mainly to a general recognition of this fact. At the present moment many of the best minds believe the cause of the existing world-wide depression to be a scarcity of gold and seek accordingly for monetary means to overcome it.

And yet, if it were asked whether understanding of the connection between money and prices has made great progress during these years, at any rate until very recently, or whether the generally accepted doctrines on this point have progressed far beyond what was generally known a hundred years ago, I should be inclined to answer in the negative. This may seem paradoxical, but I think anyone who has studied the monetary literature of the first half of the nineteenth century will agree that there is hardly any idea in contemporary monetary theory which was not known to one or more writers of that period. Probably the majority of present-day economists would contend that the reason why progress has been so slight is that monetary theory has already reached such a state of perfection that further progress must of necessity be slow. But I confess that to me it still seems that some of the most fundamental problems in this field remain unsolved, that some of the accepted doctrines are of a very doubtful validity, and that we have even failed to develop the suggestions for improvement which can be found in the works of these early writers.

If that be true, and I hope to convince you that it is, it is surely somewhat astonishing that the experiences of the last fifteen years have not proved more fruitful. In the past, periods of monetary disturbance have always been periods of great progress in this branch of Economics. The Italy of the sixteenth century has been called the country of the worst money and the best monetary theory. If recently that has not been

true to the same extent, the reason seems to me to lie in a certain change of attitude on the part of most economists in regard to the appropriate methodology of economics, a change which in many quarters is hailed as a great progress: I mean the at'tempt to substitute quantitative for qualitative methods of investigation. In the field of monetary theory, this change has been made even by economists who in general reject the "new" point of view, and indeed several had made it some years before the quantitative method had become fashionable elsewhere.

(2) The best known instance, and the most relevant case in point, is the resuscitation by Irving Fisher some twenty years ago of the more mechanistic forms of the quantity theory of the value of money in his well-known "equation of exchange." That this theory, with its apparatus of mathematical formulæ constructed to admit of statistical verification, is a typical instance of "quantitative" economics, and that it indeed probably contributed a good deal to influence the methodology of the present representatives of this school, are propositions which are not likely to be denied. I do not propose to quarrel with the positive content of this theory: I am even ready to concede that so far as it goes it is true, and that, from a practical point of view, it would be one of the worst things which could befall us if the general public should ever again cease to believe in the elementary propositions of the quantity theory. What I complain of is not only that this theory in its various forms has unduly

usurped the central place in monetary theory, but that the point of view from which it springs is a positive hindrance to further progress. Not the least harmful effect of this particular theory is the present isolation of the theory of money from the main body of general economic theory.

For so long as we use different methods for the explanation of values as they are supposed to exist irrespective of any influence of money, and for the explanation of that influence of money on prices, it can never be otherwise. Yet we are doing nothing less than this if we try to establish *direct* causal connections between the *total* quantity of money, the *general level* of all prices and, perhaps, also the *total* amount of production. For none of these magnitudes *as such* ever exerts an influence on the decisions of individuals; yet it is on the assumption of a knowledge of the decisions of individuals that the main propositions of non-monetary economic theory are based. It is to this "individualistic" method that we owe whatever understanding of economic phenomena we possess; that the modern "subjective" theory has advanced beyond the classical school in its consistent use is probably its main advantage over their teaching.

If, therefore, monetary theory still attempts to establish causal relations between aggregates or general averages, this means that monetary theory lags behind the development of economics in general. In fact, neither aggregates nor averages do act upon one another, and it will never be possible to establish necessary

connections of cause and effect between them as we can between individual phenomena, individual prices, etc. I would even go so far as to assert that, from the very nature of economic theory, averages can never form a link in its reasoning ; but to prove this contention would go far beyond the subject of these lectures. I shall here confine myself to an attempt to show in a special field the differences between explanations which do and explanations which do not have recourse to such concepts.

(3) As I have said already, I do not want to criticise the doctrines of these theories so far as they go ; I indicate their characteristics only in order to be able to show later on how much more another type of theory may accomplish. The central preoccupation of these theories is changes in the general price level. Now everybody agrees that a change of prices would be of no consequence whatever if all prices in the widest sense of the term were affected equally and simultaneously. But the main concern of this type of theory is avowedly, with certain suppositious " tendencies, which affect *all* prices equally, or at any rate impartially, at the same time and in the same direction."¹ And it is only after the alleged causal relation between changes in the quantity of money and average prices has thus been established that effects on relative prices are considered. But as the assumption generally is that changes in the quantity of money affect only the general

¹ This is the formulation of R. G. Hawtrey. Cf. his lecture on " Money and Index Numbers " in the *Journal of the Royal Statistical Society*, Vol. XCIII, Part I, 1930, p. 65.

price level, and that changes of relative prices are due to "disturbing factors" or "frictions," changes in relative prices are not part of this explanation of the changes in the price level. They are mere accompanying circumstances which experience has taught us to be regularly connected with changes of the price level, not, as might be thought, necessary consequences of the same causes. This is very clear from the form of exposition and the concepts it employs. Certain "lags" are found to exist between the changes of different prices. The prices of different goods are said generally to be affected in a definite sequence, and it is always implied that all this would never take place if the general price level did not change.

When we come to the way in which the influence of prices on production is conceived by this theory, the same general characteristics are to be discovered. It is the price level, the changes of which are supposed to influence production ; and the effect considered is not the effect upon particular branches of production, but the effect upon the volume of production in general. In most cases, no attempt is made to show why this must be so ; we are referred to statistics which show that in the past a high correlation of general prices and the total volume of production has been present. If an explanation of this correlation is attempted, it is generally simply to the effect that the expectation of selling at higher prices than present costs will induce everybody to expand production, while in the opposite case the fear of being compelled to sell below costs will

prove a strong deterrent. That is to say, it is only the general or average movement of prices which counts.

Now this idea that changes of relative prices and changes in the volume of production are consequent upon changes in the price level, and that money affects individual prices only by means of its influence on the general price level, seems to me to be at the root of at least three very erroneous opinions: *Firstly*, that money acts upon prices and production only if the general price level changes, and, therefore, that prices and production are always unaffected by money,—that they are at their “natural” level,—if the price level remains stable. *Secondly*, that a rising price level tends always to cause an increase of production, and a falling price level always a decrease of production; and *thirdly*, that “monetary theory might even be described as nothing more than the theory of how the value of money is determined”.¹ It is such delusions, as we shall see, which make it possible to assume that we can neglect the influence of money so long as the value of money is assumed to be stable, and apply without further qualification the reasonings of a general economic theory which pays attention to “real causes” only; and that we have only to add to this theory a separate theory of the value of money and of the consequences of its changes in order to get a complete explanation of the modern economic process.

Further details are unnecessary. You are all sufficiently familiar with this type of theory to supply

¹ R. G. Hawtrey, l.c., p. 64.

these for yourselves and to correct any exaggerations which I may have committed in my endeavour to make the contrast with the other types of theory as strong as possible. Any further strengthening of the contrast can best be carried out by my proceeding forthwith to the second of the major stages in the development of monetary theory. I wish only to emphasise, before I pass on to that, that henceforward when I speak of stages of development, I do not mean that each of these stages has in turn taken the place of the foregoing as the recognised doctrine. Quite on the contrary, each of these stages is still represented among contemporary monetary theorists, and indeed in all probability the first has still the greatest number of adherents.

(4) As might be expected, the second stage arises by way of dissatisfaction with the first. This dissatisfaction makes its appearance quite early. Locke and Montanari, at the end of the seventeenth century, had stated quite clearly the theory I have been stating. Richard Cantillon, whose criticism of Locke I have taken as the motto of this lecture, realised its inadequacy, and, in his famous *Essai sur le Commerce* (1755), he provides the first attempt known to me to trace the actual chain of cause and effect between the amount of money and prices. In a brilliant chapter, which W. S. Jevons called "one of the most marvellous things in the book", he attempts to show "by what path and in what proportion the increase of money raises the price of things." Starting from the assumption

of the discovery of new gold or silver mines, he proceeds to show how this additional supply of the precious metals first increases the incomes of all persons connected with their production, how the increase of the expenditure of these persons next increases the prices of things which they buy in increased quantities, how the rise in the prices of these goods increases the incomes of the sellers of these goods, how they, in their turn, increase their expenditure, and so on. He concludes that only those persons are benefited by the increase of money whose incomes rise early, while to persons whose incomes rise later the increase of the quantity of money is harmful.

Better known is the somewhat shorter exposition of the same idea which David Hume gave a little later in a famous passage of his *Political Discourses*¹, which so closely resembles the words of Cantillon that it is hard to believe that he had not seen one of those manuscripts of the *Essai* which are known to have been in private circulation at the time when the *Discourses* were written. Hume, however, makes it clear that, in his opinion, "it is only in this interval or intermediate situation, between the acquisition of money and the rise of prices, that the increasing quantity of gold and silver is favourable to industry".

To the Classics, this line of reasoning did not seem

¹ Published 1752, republished as part of his *Essays Moral, Political and Literary* (Pt. II, Essay IV, Of Money) which originally appeared in 1742, and therefore are often wrongly quoted with that date.

susceptible of improvement. While Hume is often quoted, his method of approach was not amplified for more than a century. It was not until the increase of the supply of gold consequent upon the Californian and Australian discoveries that there was any new impetus to this type of analysis. J. E. Cairnes' *Essay on the Australian Gold Discoveries*¹ contains probably the most noteworthy refinement of the argument of Cantillon and Hume before it was finally incorporated into more modern explanations based upon the subjective theories of value.

It was inevitable that modern theory should be sympathetic towards a point of view which traces the effects of an increase of money to its influence on individual decisions. But a generation passed before serious attempts were made to base the explanation of the value of money and the effects of changes in the amount of money upon the fundamental concepts of marginal utility theory. I shall not dwell here at any length on the variety of forms this assumes in the "income theories" of the value of money by Wieser, Professor Aftalion and Professor Mises. In the form it has received at the hands of Professor Mises, it belongs already to the third and fourth of our main stages of development, and I shall have occasion to refer to it later. It is worth noticing, however, that, in so far as these theories

¹ Essays towards a Solution of the Gold Question, in *Essays in Political Economy, Theoretical and Applied*, London, 1873, particularly Essay II: "The Course of Depreciation." These *Essays* were originally published in 1855-60 in the *Frazers Magazine* and the *Edinburgh Review*.

are confined to an explanation of the manner in which the effects of an increase in the amount of money are distributed through the various channels of trade, they still suffer from a not unimportant defect. While they succeed in providing a general scheme for the deduction of the successive effects of an increase or decrease of the amount of money, provided that we know where the additional money enters into circulation, they do not help us to make any *general* statements about the effects which any change in the amount of money must have. For, as I shall show later, everything depends on the point where the additional money is injected into circulation (or where money is withdrawn from circulation), and the effects may be quite opposite according as the additional money comes first into the hands of traders and manufacturers or directly into the hands of salaried people employed by the State.

(5) Very early, and, in the beginning, with only little relation to the problem of the value of money, there had, however, sprung up a doctrine, or rather a number of closely related doctrines, the importance of which was not appreciated at the time, although in the end they were to be combined to fill the gap I have been discussing. I refer to the doctrines of the influence of the quantity of money on the rate of interest, and through it on the relative demand for consumers' goods on the one hand and producers' or capital goods on the other. These form the third stage in the development of monetary theory. These doctrines have had

to surmount unusual obstacles and prejudices, and until recently they received very little attention. It almost seems as if economists had for so long a time struggled against the popular confusions between the value of money proper and the price for a money loan that in the end they had become almost incapable of seeing that there was any relation at all between the rate of interest and the value of money. It is therefore worth while attempting to trace their development in rather greater detail.

While the existence of some relation between the quantity of money and the rate of interest was clearly recognised very early—traces of an understanding could certainly be found in the writings of Locke and Dutot—the first author known to me to enunciate a clear doctrine on this point was Henry Thornton. In his *Paper Credit of Great Britain*, published in 1802 at the beginning of the discussion on Bank Restriction—a really remarkable performance, the true importance of which is only now beginning to be recognised—he struck for the first time one of the leading notes of the new doctrine. The occasion for his statement was an inquiry into the question whether there existed a natural tendency to keep the circulation of the Bank of England within the limits which would prevent a dangerous depreciation. Thornton denied that such a natural tendency existed and held that, on the contrary, the circulation might expand beyond all assignable limits if the Bank would only keep its rate of interest low enough. He based his opinion on considerations so

weighty that I cannot resist quoting them at some length :

" In order to ascertain, how far the desire of obtaining loans at the Bank may be expected at any time to be carried, we must enquire into the subject of the quantum of profit likely to be derived from borrowing there under the existing circumstances. This is to be judged of by considering two points: the amount, first, of interest to be paid on the sum borrowed; and, secondly, of the mercantile or other gain to be obtained by the employment of the borrowed capital. The gain which can be acquired by the means of commerce is commonly the highest which can be had; and it also regulates, in a great measure, the rate in all other cases. We may, therefore, consider this question as turning principally on a comparison of the rate of interest taken at the bank with the current rate of mercantile profit"¹ (p. 267).

Thornton restated these doctrines in the first of his two speeches on the Bullion Report, which were also published as a booklet² and would deserve being recovered from oblivion. In this speech he attempts to call the attention of the House to the subject of the rate of interest as " a very great and turning point ", and, after restating his theory in a shorter form, adds a new and different theory on the relations between prices and interest (which must on no account be confused with his other theory) namely a theory of the influence of an expectation of a rise of prices on the

¹ In order to appreciate the importance of this statement, another passage occurring a little earlier in the same chapter (p. 261) should be consulted. In the course of this passage, Thornton writes: " As soon, however, as the circulating medium *ceases to increase*, the extra profit is at an end." (*Italics mine.*)

² Substance of two speeches by Henry Thornton, Esq., in the debate in the House of Commons on the report of the Bullion Committee on the 7th and 14th May, 1811, London, 1811. Cf. particularly pp. 19 *et sequ.*

money rate of interest, a theory which later on was to be re-discovered by A. Marshall and Irving Fisher. This theory, however, does not concern us here.¹

Thornton's theory seems to have been generally accepted among the "bullionists", though it was forgotten, by the time that the doctrine of this school became the target of those attacks of the Banking School to which it would have been a sufficient answer. Within the next two years it had been restated by Lord King² and J. L. Foster,³ and, what is much more important, it was accepted by David Ricardo, in his pamphlet of 1809, who gave it a still more modern ring by speaking of the rate of interest falling below its *natural level* in the interval between the issues of the Bank and their effects on prices.⁴ He repeated this also in his *Principles*,⁵ which should have been sufficient to make it generally known. The doctrine makes its appearance in the Bullion Report,⁶ and it remained familiar to economists for some time after the restriction period.

¹ Cf. T. E. Gregory, Introduction to Tooke and Newmarch's *History of Prices and of the State of the Circulation*, p. 23. Professor Gregory does not, however, clearly distinguish between the two theories.

² *Thoughts on the Effects of the Bank Restriction*, London, 1803, p. 20.

³ *An Essay on the Principles of Commercial Exchanges*, 1804, p. 113.

⁴ *The high price of bullion a proof of the depreciation of Bank Notes*. Third edit., 1810, p. 47. *Essays*, ed. E. C. K. Gonner, p. 35.

⁵ *Principles of Political Economy and Taxation*, Works, ed. McCulloch, p. 220.

⁶ *Bullion Report*, etc., octavo edit., 1810, p. 56; ed. Cannan, p. 51.

In 1823, Thomas Joplin¹, the inventor of the currency doctrine, enumerates the same principle in his peculiar but very interesting theory of the "pressure and anti-pressure of capital upon currency" and propounds it as a new discovery. Though his theory is interwoven with some quite erroneous opinions, which probably prevented his contemporaries from recognising the real contributions contained in his writings, yet, nevertheless, he succeeds in providing the clearest explanation of the relations between the rate of interest and the fluctuations of the note circulation which had been given up to that time. The principle which, in Joplin's opinion, neither Thornton nor those who adopted his opinions discovered, and which probably was responsible for "every great fluctuation in prices that has occurred since the first establishment of our banking system", is that when the supply of capital exceeds the demand, it has the effect of compressing the country circulation: when the demand is greater than the supply, it has the effect of expanding it again (p. 101). He devotes some pages to an exposition of how the rate of interest operates to equalise

¹ In a work entitled *Outlines of a system of Political Economy; written with a view to prove . . . that the cause of the present agricultural distress is entirely artificial, and to suggest a plan for the management of currency*, London, 1823. I have not been able to obtain a copy of the original work. The exposition of Joplin's doctrines given in the text is based on a later book by the author, entitled *Analysis and History of the Currency Question*, London, 1832, in which he repeats the doctrines expounded in the former book, which, as he says, was a failure and not noticed by more than two reviews which both abused it. The references in the text are to the *Analysis and History*.

the demand for and the supply of capital, and how any change of that rate affects productive activity, and then proceeds: " But, with our currency, or rather the currency of the country banks. . . the effects are different. The interest of money, when it is abundant, is not reduced, but the circulation . . . is diminished ; and on the contrary, when money is scarce, an enlargement of issues takes place, instead of a rise in the rate of interest. The Country Bankers never vary the interest they charge. . . . He must, of necessity, have one fixed charge, whatever it may be : for he never can know what the true rate is. With a metallic currency, on the contrary, the Banker would always know the state of the market. In the first place, he could not lend money until it had been saved and placed in his hands, and he would have a particular amount to lend. On the other hand, he would have more or fewer persons wanting to borrow, and in proportion as the demand would exceed or fall short of the amount he had to lend, he would raise or lower his terms : . . . But, in consequence of the Country Banks being not only dealers in incipient capital, but issuers of currency, the demand for currency and the demand for capital are so mingled together that all knowledge of either is totally confounded ". (pp. 108-109. Cf. also pp. 111-113.)

For the next seventy-five years there was hardly any progress in this connection. Three years after Joplin, in 1826, Thomas Tooke (who eighteen years later

was to enlarge upon the erroneousness of what he then could already call the commonly received doctrine that a low rate of interest is calculated to raise prices and a high rate to depress them)¹ accepted Thornton's doctrine, and developed it in some minor points.² As late as 1840 the doctrine that the "demand for loans and discounts at a rate below the usual rate is insatiable" was treated almost as a matter of course by another great genius, N. W. Senior,³ and it even entered, though in a somewhat emasculated form, into J. S. Mill's *Principles of Political Economy*.⁴

(6) Before following the more modern development of this theory, I must, however, trace the origins of the second strand of thought which in the end became interwoven with the one just considered to constitute modern doctrine in this matter. While the line of thought we have already considered pays attention only to the relation between the rate of interest, the amount of money in circulation and, as a necessary consequence of the latter, the general price level, the second pays attention to the influence which an increase in the amount of money exercises upon the production

¹ T. Tooke, *An Inquiry into the Currency Principle*, London, 1844, p. 77.

² Tooke, *Considerations on the State of the Currency*, London, 1826, p. 22, footnote. As late as 1840 he still reprinted this note in the appendix to the first volume of his *History of Prices* though not without omitting some important sentences. Cf. Gregory, Introduction, p. 25.

³ In an anonymous article entitled "Lord King" in the *Edinburgh Review*, October, 1846. The relevant parts of this article are now reprinted in N. W. Senior's *Industrial Efficiency and Social Economy*, ed. by S. Leon Levy. New York, 1928. Vol. II, pp. 117-118.

⁴ Book III, Chap. XXIII, para. 4, ed. Ashley, p. 646 *et sequ.*

of capital, either directly or through the rate of interest. The theory that an increase of money brings about an increase of capital, which has recently become very popular under the new-fangled name of "forced saving", is almost as old as the one we have just been considering. The honour of having drawn attention to this problem is probably due to T. R. Malthus, who, in 1811, in an unsigned review¹ of Ricardo's first pamphlet, introduces his remarks with the complaint that no writer he is acquainted with "has ever seemed sufficiently aware of the influence which a different distribution of the circulating medium of the country must have on those accumulations which are destined to facilitate future production". He then demonstrates on an assumed "strong case" that a change of the proportion between capital and revenue to the advantage of capital so "as to throw the produce of the country chiefly in the hands of the productive classes" would have the effect that "in a short time, the produce of the country would be greatly augmented". The next paragraph must be quoted in full. He writes :

"Whenever, in the actual state of things, a fresh issue of notes comes into the hands of those who mean to employ them in the prosecution and extension of profitable business, a difference in the distribution of the circulating medium takes place, similar in kind to that which has been last supposed ; and produces similar, though of course comparatively inconsiderable effects, in altering the proportion between capital and revenue in favour of the former. The new notes go into the market as so much additional capital, to purchase what

¹ *Edinburgh Review*, Vol. XVII. No. XXXIV February, 1811, p. 363 *et seq.* Cf. also the reply of Ricardo in appendix to the fourth edition of his pamphlet on the *High Price of Bullion*.

is necessary for the conduct of the concern. But, before the produce of the country has been increased, it is impossible for one person to have more of it, without diminishing the shares of some others. This diminution is affected by the rise of prices, occasioned by the competition of the new notes, which puts it out of the power of those who are only buyers, and not sellers, to purchase as much of the annual produce as before: While all the industrious classes,—all those who sell as well as buy,—are, during the progressive rise of prices, making unusual profits; and, even when this progression stops, are left with the command of a greater portion of the annual produce than they possessed previous to the new issues.”

The recognition of this tendency of an increased issue of notes to increase the national capital does not blind Malthus to the dangers and manifest injustice connected with it. He simply offers it, he says, as a rational explanation of the fact that a rise of prices is generally found conjoined with public prosperity.

(7) This suggestion of Malthus was not appreciated at the time—though the mere fact that Ricardo replied to it at length should have made it familiar to economists—and I have also not succeeded in tracing any direct influence on other writers of the first half of the nineteenth century, though this might very likely be possible. Even in the period after the publication of J. S. Mill's *Principles*, for a long time attention was paid only to the first of the two related ideas we have been analysing. For a long time there was very little progress at all. The doctrine of the indirect chain of effects connecting money and prices, as developed by Sidgwick, Giffen, Nicholson, and even Marshall¹

¹ Cf. J. W. Angell, *The Theory of International Prices*, Cambridge, 1926, p. 117 *et seq.*

adds hardly anything to what had been evolved from Thornton to Tooke. It is only quite at the end of the century that the Swede, Knut Wicksell¹, made a contribution of signal importance by a rediscovery of the doctrine which had been enunciated by Thornton, combined with a theory of the influence of changing money supplies on the formation of capital. His success in this regard is explained by the fact that his attempt was based on a modern and highly developed theory of interest, that of Böhm-Bawerk. But by a curious irony of fate, Wicksell has become famous, not for his real improvements on the old doctrine, but for the one point in his exposition in which he definitely erred: namely, for his attempt to establish a rigid connection between the rate of interest and the changes in the general price level.

Put concisely, Wicksell's theory is as follows: If it were not for monetary disturbances, the rate of interest would be determined so as to equalise the demand for real capital and the supply of savings. This equilibrium rate, as I prefer to call it, he christens the natural² rate of interest. In a money economy, the

¹ Wicksell's first and most important exposition of this doctrine is in his *Geldzins und Güterpreise* (published in German. Jena, 1898) which should be consulted together with Wicksell's later restatement in the second volume of his *Vorlesungen über Nationalökonomie*, Jena, 1922.

² Sometimes also the "normal" (p. 111) or "real" rate of interest. This latter form of expression has given rise to a confusion with a different theory concerning the influence of an expectation of price changes on the rate, which is commonly associated with the name of Fisher, but which, as mentioned before, was already known to Thornton, Ricardo and Marshall.

actual or money rate of interest ("Geldzins") may differ from the equilibrium or natural rate, because the demand for and the supply of capital do not meet in their natural form but in the form of money, the quantity of which available for capital purposes may be arbitrarily changed by the banks.

Now, so long as the money rate of interest coincides with the equilibrium rate, the rate of interest remains "neutral" in its effects on the prices of goods, tending neither to raise nor to lower them. When the banks, however, lower the money rate of interest below the equilibrium rate, which they can do by lending more than has been entrusted to them, i.e., by adding to the circulation, this must tend to raise prices; if they raise the money rate above the equilibrium rate—a case of less practical importance—they exert a depressing influence on prices. From this correct statement, however, which does not imply that the price level would remain unchanged if the money rate corresponds to the equilibrium rate, but only that, in such conditions, there are no *monetary* causes tending to produce a change of the price level, Wicksell jumps to the conclusion that, so long as the two rates agree, the price level must always remain steady. There will be more to say about this later. For the moment, it is worth observing a further development of the theory. The rise of the price level which is supposed to be the necessary effect of the money rate remaining below the equilibrium rate, is in the first instance brought about by the entrepreneurs spending on production the

increased amount of money loaned by the banks. This process, as Malthus had already shown, involves what Wicksell now for the first time called enforced or compulsory saving.¹ That is all I need to say here in explanation of the Wicksellian theory. Nor shall I here discuss the important development of this theory added by the Austrian economist, Professor Mises.² An exposition of the present form of this theory will form the main subject of my next two lectures. Here it is only necessary to point out that Professor Mises has improved the Wicksellian theory by an analysis of the different influences which a money rate of interest different from the equilibrium rate exercises on the prices of consumers' goods on the one hand, and the prices of producers' goods on the other. In this way, he has succeeded in transforming the Wicksellian theory into an explanation of the credit cycle which is logically satisfactory.

(8) But this brings me to the next part of my discussion. For it is partly upon the foundations laid by Wicksell and partly upon criticism of his doctrine that what seems to me the fourth of the great stages of the progress of monetary theory is being built. (I ought, perhaps, expressly to warn you that while up to this point of our survey I have been describing developments which have already taken place, what I am about to say about the fourth stage

¹ *Geldzins und Güterpreise*, pp. 102, 143.

² *Theorie des Geldes und der Umlaufsmittel*, 1912.

concerns rather what I think it should be than what has already taken definite shape.)

It would take too much time to trace chronologically the steps by which, by degrees, the Wicksellian theory has been transformed into something new. You will be better able to appreciate this change if I turn immediately to the discussion of those deficiencies of his doctrine which eventually made it necessary definitely to break away from certain of the fundamental concepts in the theory which had been taken over by him from his predecessors.

I have mentioned already that, according to Wicksell the equilibrium rate of interest was a rate which simultaneously restricted the demand for real capital to the amount of savings available *and* secured stability of the price level. His idea was obviously one which is very generally held even at the present time, namely, that as, at an equilibrium rate of interest, money would remain neutral towards prices, therefore in such circumstances there could be no reason at all for a change of the price level.

Nevertheless, it is perfectly clear that, in order that the supply and demand for real capital should be equalised, the banks must not lend more or less than has been deposited with them as savings. And this means naturally that they must never change the amount of their circulation. At the same time, it is no less clear that, in order that the price level may remain unchanged, the amount of money in circulation must change as the volume of production increases

or decreases. The banks could *either* keep the demand for real capital within the limits set by the supply of savings, *or* keep the price level steady ; but they cannot perform both functions at once. Save in a society in which there were no additions to the supply of savings, i.e., a stationary society, to keep the money rate of interest at the level of the equilibrium rate would mean that in times of expansion of production the price level would fall. To keep the general price level steady would mean, in similar circumstances, that the loan rate of interest would have to be lowered below the equilibrium rate. The consequences would be what they always are when the rate of investment exceeds the rate of saving.

It would be possible to cite other cases where the influence of money on prices and production is quite independent of the effects on the general price level. But it seems obvious as soon as one once begins to think about it that almost any change in the amount of money, whether it does influence the price level or not, must *always* influence relative prices. And, as there can be no doubt that it is relative prices which determine the amount and the direction of production, almost any change in the amount of money must necessarily also influence production.

But if we have to recognise that, on the one hand, under a stable price level, relative prices may be changed by monetary influences, and, on the other that relative prices may remain undisturbed only when the price level changes, we have to give up the generally received

opinion that if the general price level remains the same, the tendencies towards economic equilibrium are not disturbed by monetary influences, and that disturbing influences from the side of money cannot make themselves felt otherwise than by causing a change of the general price level.

This doctrine, which has been accepted dogmatically by almost all monetary theorists, seems to me to lie at the root of most of the shortcomings of present-day monetary theory and to be a bar to almost all further progress. Its bearing on various proposals for stabilisation is obvious. For the moment, however, it is in the theoretical foundations of these schemes rather than in the formulation of alternative practical proposals that we are interested. And here, it may be suggested, it is possible very greatly to underestimate the changes in economic theory which are implied if once we drop these unjustified assumptions. For when we investigate into all the influences of money on individual prices, quite irrespective of whether they are or are not accompanied by a change of the price level, it is not long before we begin to realise the superfluity of the concept of a general value of money, conceived as the reverse of some price level. And, indeed, I am of the opinion that, in the near future, monetary theory will not only reject the explanation in terms of a direct relation between money and the price level, but will even throw overboard the concept of a general price level and substitute for it investigations into the causes of the changes of relative prices

and their effects on production. Such a theory of money, which will be no longer a theory of the value of money in general, but a theory of the influence of money on the different ratios of exchange between goods of all kinds, seems to me the probable fourth stage in the development of monetary theory.

This view of the probable future of the theory of money becomes less startling if we consider that the concept of relative prices includes the prices of goods of the same kind at different moments, and that here, as in the case of interspatial price relationships, only one relation between the two prices can correspond to a condition of "intertemporal" equilibrium, and that this need not, *a priori*, be a relation of identity or the one which would exist under a stable price level. (This has a particular bearing on the problem of money as a standard of deferred payments, because in this function money is to be conceived simply as the medium which effects an intertemporal exchange.) If this view is correct, the question which in my opinion will take the place of the question whether the value of money has increased or decreased will be the question whether the state of equilibrium of the rates of intertemporal exchange is disturbed by monetary influences in favour of future or in favour of present goods.¹

¹ I have dealt more fully with the difficult question of the conditions of intertemporal equilibrium of exchange in an article "Das intertemporale Gleichgewichtssystem der Preise und die Bewegungen des 'Geldwertes'" in the *Weltwirtschaftliches Archiv.*, vol. 28, 1928.

(9) It will be the object of the following lectures to show how it is possible to solve at least some of the most important problems of monetary theory without recourse to the concept of a value of money in general. It will then remain for you to make up your mind whether we can conceivably entirely dispense with it. For the moment, I wish only to give one further reason why it seems to me that, in the case of money, in contrast to any other good, the question of its value in general is of no consequence.

We are interested in the prices of individual goods because these prices show us how far the demand for any particular good can be satisfied. To discover the causes why certain needs, and the needs of certain persons, can be satisfied to a greater degree than others is the ultimate object of economics. There is, however, no *need* for money in this sense,—the absolute amount of money in existence is of no consequence to the well-being of mankind—and there is, therefore, no objective value of money in the sense in which we speak of the objective value of goods. *What we are interested in is only how the relative values of goods as sources of income or as means of satisfaction of wants are affected by money.*

The problem is never to explain any “general value” of money but only how and when money influences the relative values of goods and under what conditions it leaves these relative values undisturbed, or, to use a happy phrase of Wicksell, when money remains *neutral* relatively to goods. Not a money

which is *stable* in value but a *neutral* money must therefore form the starting point for the theoretical analysis of monetary influences on production, and the first object of monetary theory should be to clear up the conditions under which money might be considered to be neutral in this sense. We stand as yet at the very beginning of this kind of investigation. And, though I hope that what I say in the next lectures may help a little, I am fully conscious that all results we obtain at this stage should only be regarded as tentative. So far as I am concerned, it is the method of approach more than the details of the results which is of importance in what follows.

LECTURE II

THE CONDITIONS OF EQUILIBRIUM BETWEEN THE PRODUCTION OF CONSUMERS' GOODS AND THE PRODUCTION OF PRODUCERS' GOODS

" The question of how far, and in what manner, an increase of currency tends to increase capital appears to us so very important, as fully to warrant our attempt to explain it. . . . It is not the *quantity* of the circulating medium which produces the effects here described, but the *different distribution* of it . . . on every fresh issue of notes . . . a larger proportion falls into the hands of those who consume and produce, and a smaller proportion into the hands of those who only consume."

T. R. MALTHUS,
Edinburgh Review, vol. XVII (1811),
p. 363 *et seq.*

(1) Before we can attempt to understand the influence of prices on the amount of goods produced, we must know the nature of the immediate causes of a variation of industrial output. Simple as this question may at first appear, contemporary theory offers at least three explanations.

(2) First of these, we may take the view that the main causes of variations of industrial output are to be found in changes of the willingness of individuals to expend effort. I mention this first, because it is probably the theory which has at present the greatest

number of adherents in this country. That this point of view is so widely accepted in England is probably due to the fact that a comparatively great number of economists here are still under the influence of "real cost" theories of value which make this type of explanation of any change in the total value of output the natural one. Mr. D. H. Robertson's stimulating book on *Banking Policy and the Price Level* provides, perhaps, the best example of reasoning based on this assumption. Yet I do not think that this assumption is at all justified by our common experience; it is a highly artificial assumption to which I would only be willing to resort when all other explanations had failed. But its correctness is a question of fact, and I shall make no attempt to refute it directly. I shall only try to show that there are other ways of accounting for changes in industrial output which seem less artificial.

(3) The second type of explanation is the one which "explains" variations of production simply by the changes of the amount of factors of production used. In my opinion this is no explanation at all. It depends essentially upon a specious appeal to facts. Starting from the existence of unused resources of all kinds, known to us in daily experience, it regards any increase of output simply as the consequence of bringing more unused factors into use, and any diminution of output as the consequence of more resources becoming idle. Now, that any such change in the amount of resources employed implies a corresponding change in output is, of course, beyond question. But

it is not true that the existence of unused resources is a *necessary* condition for an increase of output, nor are we entitled to take such a situation as a starting point for theoretical analysis. If we want to explain fluctuations of production, we have to give a complete explanation. Of course this does not mean that we have to start for that purpose *ab ovo* with an explanation of the whole economic process. But it does mean that we have to start where general economic theory stops ; that is to say at a condition of equilibrium when no unused resources exist. The existence of such unused resources is itself a fact which needs explanation. It is not explained by static analysis and, accordingly, we are not entitled to take it for granted. For this reason I cannot agree that Professor Wesley Mitchell is justified when he states that he considers it no part of his task "to determine how the fact of cyclical oscillations in economic activity can be reconciled with the general theory of equilibrium, or how that theory can be reconciled with facts".¹ On the contrary, it is my conviction that if we want to explain economic phenomena at all, we have no means available but to build on the foundations given by the concept of a tendency towards an equilibrium. For it is this concept alone which permits us to explain fundamental phenomena like the determination of prices or incomes, an understanding of which is essential to any explanation of fluctuations of production. If

¹ *Business Cycles, The Problem and its Setting*, New York, 1927, p. 462.

we are to proceed systematically, therefore, we must start with a situation which is already sufficiently explained by the general body of economic theory. And the only situation which satisfies this criterion is the situation in which all available resources are employed. The existence of unused resources must be one of the main objects of our explanation.¹

(4) To start from the assumption of equilibrium has a further advantage. For in this way we are compelled to pay more attention to causes of changes in the industrial output whose importance might otherwise be underestimated. I refer to changes in the methods of using the existing resources. Changes in the direction given to the existing productive forces are not only the main cause of fluctuations of the output of individual industries; the output of industry as a whole may also be increased or decreased to an enormous extent by changes in the use made of existing resources. Here we have the third of the contemporary explanations of fluctuations which I referred to at the beginning of the lecture. What I have here in mind are *not* changes in the methods of production made possible by the progress of technical knowledge, but the increase of output made possible by a transition to more capitalistic methods of production, or, what is the same thing, by organising production so that, at any given moment, the available resources

¹ I have dealt more fully with the relation between pure economic theory and the explanation of business fluctuations in my book, *Geldtheorie und Konjunkturtheorie* (Vienna—1929), Chaps. I and II.

are employed for the satisfaction of the needs of a future more distant than before. It is to this effect of a transition to more or less "round-about" methods of production that I wish particularly to direct your attention. For, in my opinion, it is only by an analysis of this phenomenon that in the end we can show how a situation can be created in which it is temporarily impossible to employ all available resources.

The processes involved in any such transition from a less to a more capitalistic form of production are of such a complicated nature that it is only possible to visualise them clearly if we start from highly simplified assumptions and work through gradually to a situation more like reality. For the purpose of these lectures, I shall divide this investigation into two parts. Today I shall confine myself to a consideration of the conditions under which an equilibrium between the production of producers' goods and the production of consumers' goods is established, and the relation of this equilibrium to the flow of money; I reserve for the next lecture a more detailed explanation of the working of the price mechanism during the period of transition, and of the relations between changes in the price system and the rate of interest.

(5) My first task is to define the precise meaning of certain terms. The term production I shall always use in its widest possible sense, that is to say, all processes necessary to bring goods into the hand of the consumer. When I mean land and labour, I shall speak of *original means of production*. When I

use the phrase *factors of production* without further qualification this will cover capital also, that is to say this term will include all factors from which we derive *income* in the form of wages, rent, and interest. When I use the expression *producers' goods*, I shall be designating all goods existing at any moment which are not consumers' goods, that is to say, *all* goods which are directly or indirectly used in the production of consumers' goods, *including* therefore the original means of production, as well as instrumental goods and all kinds of unfinished goods. Producers' goods which are not original means of production, but which come between the original means of production and consumers' goods, I shall call *intermediate products*. None of these distinctions coincides with the customary distinction between durable and non-durable goods, which I do not need for my present purpose. I shall, however, have to use this distinction and to add a new one, which stands in some relation to it, in my next lecture.

(6) I have already pointed out that it is an essential feature of our modern, "capitalistic", system of production that at any moment a far larger proportion of the available original means of production is employed to provide consumers' goods for some more or less distant future than is used for the satisfaction of immediate needs. The *raison d'être* of this way of organising production is, of course, that by lengthening the production process we are able to obtain a greater quantity of consumers' goods out of

a given quantity of original means of production. It is not necessary for my present purpose to enter at any length into an explanation of this increase of productivity by round-about methods of production. It is enough to state that within practical limits we may increase the output of consumers' goods from a given quantity of original means of production indefinitely, provided we are willing to wait long enough for the product. The thing which is of main interest for us is that any such change from a method of production of any given duration to a method which takes more or less time implies quite definite changes in the organisation of production, or, as I shall call this particular aspect of organization, to distinguish it from other more familiar aspects, changes in the *structure of production*.

In order to get a clear view of what is actually implied by these changes in the structure of production it is useful to employ a schematic representation. For this purpose, I find it convenient to represent the successive applications of the original means of production which are needed to bring forth the output of consumers' goods accruing at any moment of time, by the hypotenuse of a right-angled triangle, such as the triangle in Fig. I. The value of these original means of production is expressed by the horizontal projection of the hypotenuse, while the vertical dimension, measured in arbitrary periods from the top to the bottom, expresses the progress of time, so that the inclination of the line representing the amount of original means of production used means that these

original means of production are expended continuously during the whole process of production. The bottom

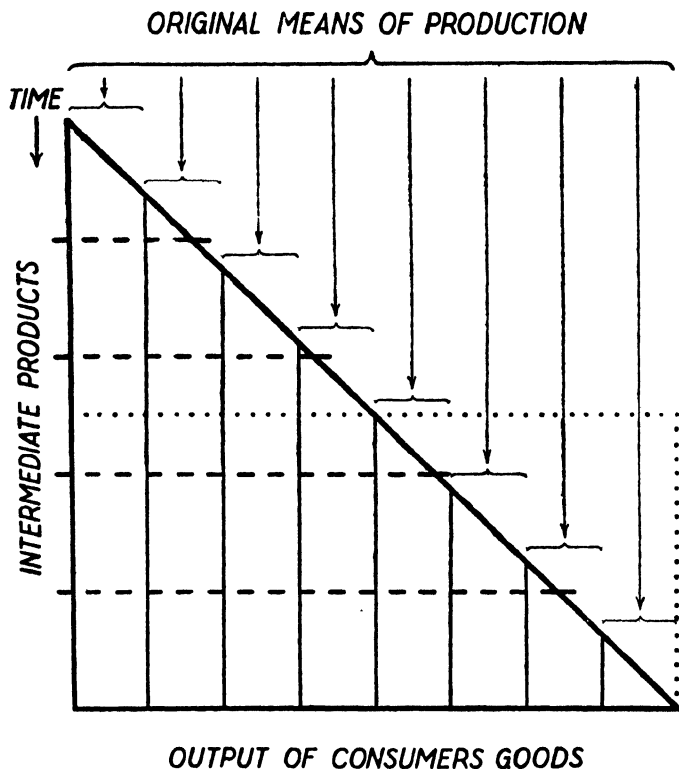


FIG. 1.

of the triangle represents the value of the current output of consumers' goods. The area of the triangle thus shows the totality of the successive stages through which the several units of original means of production

pass before they become ripe for consumption. It also shows the total amount of intermediate products which must exist at any moment of time in order to secure a continuous output of consumers' goods. For this reason we may conceive of this diagram not only as representing the successive stages of the production of the output of any given moment of time, but also as representing the processes of production going on simultaneously in a stationary society. To use a happy phrase of J. B. Clark's, it gives a picture of the "synchronised process of production".^{1 2 3}

Now it should be clear without further explanation that the proportion between the amount of intermediate products (represented by the area of the triangle) which is necessary at any moment of time to secure a continuous output of a given quantity of consumers' goods, and the amount of that output, must grow with the length of the round-about process of production. As the average time interval between the application of the original means of production and the completion

¹ The methodological bearing of the concept of a synchronised production is particularly well brought by Hans Mayer in his brilliant article, "Produktion" in the *Handwörterbuch der Staatswissenschaften*, fourth edit., vol. VI, Jena, 1925, p. 1,115 *et seq.*

² There is some difficulty in regard to the way in which durable goods, particularly instrumental goods, rendering services continuously throughout their working life, are to be taken account of in our schematic representation. While, for purposes of general theory, their period of life is to be considered as equivalent to a round-about production of corresponding length, for our purpose, it is more convenient to regard only that part of these durable goods which is currently used up and renewed as entering into the total of intermediate products existing at any moment.

³ It is perhaps worth observing that a substantially similar diagram was used by Jevons to illustrate his theory of capital. See *The Theory of Political Economy* (2nd Edition 1879) pp. 241-287.

of the consumers' goods increases, production becomes more capitalistic, and *vice versa*. In the case we are contemplating in which the original means of production are applied at a constant rate throughout the whole process of production, this average time is exactly half as long as the time which elapses between the application of the first unit of original means of production and the completion of the process. Accordingly, the total amount of intermediate products may also be represented by a rectangle half as high as the triangle, as indicated by the dotted line in the diagram. The areas of the two figures are necessarily equal, and it sometimes assists the eye to have a rectangle instead of a triangle when we have to judge the relative magnitude represented by the area of the figure. Furthermore, it should be noticed that, as the figure represents values and not physical production, the surplus return obtained by the round about methods of production is not represented in the diagram. In this lecture I have intentionally neglected interest. We shall have to take that into consideration next time. Until then we may assume that the intermediate products remain the property of the owners of the original means of production until they have matured into consumers' goods and are sold to consumers. Interest is then received by the owners of the original means of production together with wages and rent.

(7) A perfectly continuous process of this sort is somewhat unwieldy for theoretical purposes: moreover such an assumption is not perhaps sufficiently

realistic. It would be open to us to deal with the difficulties by the aid of higher mathematics. But I, personally, prefer to make it amenable to a simpler method by dividing the continuous process into distinct periods, and by substituting for the concept of a continuous flow the assumption that goods move intermittently in equal intervals from one stage of production to the next. In this way, in my view, the loss in precision is more than compensated by the gain in lucidity.

Probably the simplest method of transforming the picture of the continuous process into a picture of what happens in a given period is to make cross sections through our first figure at intervals corresponding to the periods chosen, and to imagine observers being posted at each of these cross cuts who watch and note down the amount of goods flowing by. If we put these cross sections, as indicated by the broken lines in Fig. 1, at the end of each period, and represent the amount of goods passing these lines of division in a period by a rectangle of corresponding size, we get the new illustration of the same process given in Fig. 2.

It is convenient for the purposes of exposition to count only that part of the total process of production which is completed during one of these periods, as a separate stage of production. Each of the successive shaded blocks in the diagram will then represent the product of the corresponding stage of production as it is passed on to the next while the differences in the length of the successive blocks correspond to the amount of

original means of production used in the succeeding stage. The white block at the bottom represents

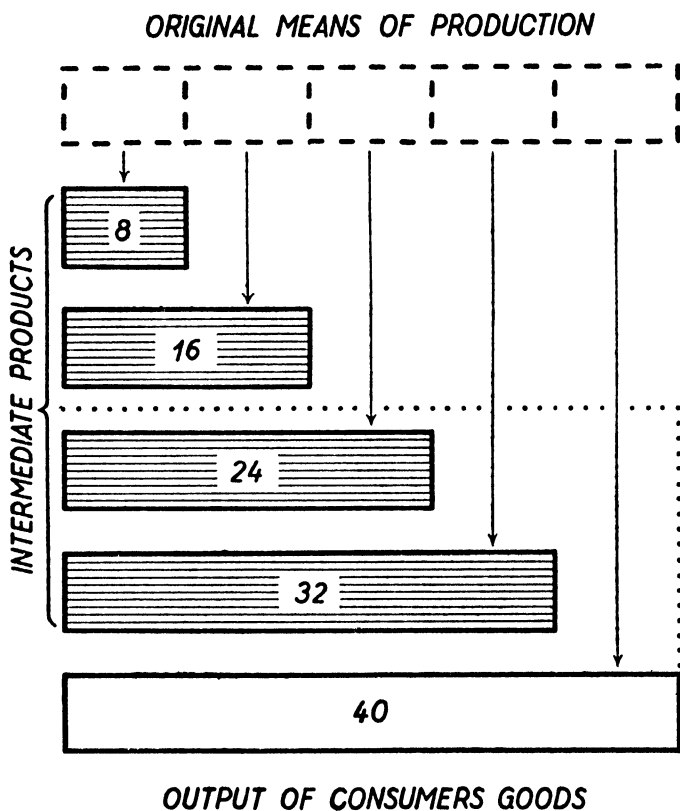


FIG. 2.

the output of consumers' goods during the period. In a stationary state, which is still the only state I am

considering, this output of consumers' goods is necessarily equal to the total income from the factors of production used, and is exchanged for this income. The proportion of the white area to the shaded area, in this diagram 40:80 or 1:2, expresses the proportion between the output of consumers' goods and the output of intermediate products (or between the amount of consumption and the amount of new and renewed investment during any period of time).

So far, I have used this schematic illustration of the process of production only to represent the movements of goods. It is just as legitimate to use it as an illustration of the movement of money. While goods move downwards from the top to the bottom of our diagram, we have to conceive of money moving in the opposite direction, being paid first for consumers' goods and thence moving upwards until, after a varying number of intermediary movements, it is paid out as income to the owners of the factors of production, who in turn use it to buy consumers' goods. But in order to trace the relation between actual money payments, or the proportional quantities of money used in the different stage of production, and the movements of goods, we need a definite assumption in regard to the division of the total process among different firms, which alone makes an exchange of goods against money necessary. For this does not by any means necessarily coincide with our division into separate stages of production of equal length. I shall begin with the simplest assumption, that these two divisions do coincide, that

is to say that goods moving towards consumption do change hands against money in equal intervals which correspond to our unit production periods.

In such a case, the proportion of money spent for consumers' goods and money spent for intermediate products is equal to the proportion between the total demand for consumers' goods and the total demand for the intermediate products necessary for their continuous production ; and this, in turn, must correspond, in a state of equilibrium, to the proportion between the output of consumers' goods during a period of time and the output of intermediate products of all earlier stages during the same period. Given the assumptions we are making, all these proportions are accordingly equally expressed by the proportion between the area of the white rectangle and the total shaded area. It will be noticed that the same device of the dotted line as was used in the earlier figure is employed to facilitate the comparison of the two areas. The dotted rectangle shows that, in the kind of production represented by Fig. 2, which actually takes four successive stages, the average length of the round-about process is only two stages, and the amount of intermediate products is therefore twice as great as the output of consumers' goods.

(8) Now if we adopt this method of approach, certain fundamental facts at once become clear. The first fact which emerges is that the amount of money spent on producers' goods during any period of time may be far greater than the amount spent for

consumers' goods during the same period. It has been computed, indeed, that in the United States, payments for consumers' goods amount only to about one-twelfth of the payments made for producers' goods of all kinds¹. Nevertheless, this fact has not only very often been overlooked, it was even expressly denied by no less an authority than Adam Smith. According to Smith²: "The value of goods circulated between the different dealers never can exceed the value of those circulated between dealers and consumers; whatever is bought by the dealer being ultimately destined to be sold to the consumers". This proposition clearly rests upon a mistaken inference from the fact that the total expenditure made in production must be covered by the return from the sale of the ultimate products; but it remained unrefuted, and quite recently in our own day it has formed the foundation of some very erroneous doctrines.³ The solution of the difficulty is, of course, that most goods are exchanged several times against money before they are sold to the consumer, and on the average exactly as

¹ Cf. M. W. Holtrop, *De Omloopssnelheid van het Geld*, Amsterdam, 1928, p. 181.

² *Wealth of Nations*, Book II, Chap. I, ed. Cannan, p. 305. It is interesting to note that this statement of Adam Smith is referred to by Thomas Tooke as a justification of the erroneous doctrines of the Banking School. (Cf. *An Inquiry into the Currency Principle*, London, 1844, p. 71.)

³ Cf. W. T. Foster and W. Catchings, *Profits*, Publications of the Pollak Foundation for Economic Research, No. 8, Boston and New York, 1925, and a number of other books by the same authors and published in the same series. For a detailed criticism of their doctrines, cf. my article, "Gibt es einen 'Widersinn des Sparens'?" *Zeitschrift für Nationalökonomie*, Vol. I, Vienna, 1929.

many times as often as the total amount spent for producers' goods is larger than the amount spent for consumers' goods.

Another point which is of great importance for what follows, and which, while often overlooked in current discussion, is quite obvious if we look at our diagram, is the fact that what is generally called the capital equipment of society—the total of intermediate products in our diagram—is not a magnitude which, once it is brought into existence, will necessarily last for ever independently of human decisions. Quite the contrary: whether the structure of production remains the same depends entirely upon whether entrepreneurs find it profitable to re-invest the usual proportion of the return from the sale of the product of their respective stages of production in turning out intermediate goods of the same sort. Whether this is profitable, again, depends upon the prices obtained for the product of this particular stage of production on the one hand and on the prices paid for the original means of production and for the intermediate products taken from the preceding stage of production on the other. The continuance of the existing degree of capitalistic organisation depends, accordingly, on the prices paid and obtained for the product of each stage of production and these prices are, therefore, a very real and important factor in determining the direction of production.

The same fundamental fact may be described in a slightly different way. The money stream which the

entrepreneur representing any stage of production receives at any given moment is always composed of net income which he may use for consumption without disturbing the existing method of production, and of parts which he must continuously re-invest. But it depends entirely upon him whether he re-distributes his total money receipts in the same proportions as before. And the main factor influencing his decisions will be the magnitude of the profits he hopes to derive from the production of his particular intermediate product.

(9) And now at last we are ready to commence to discuss the main problem of this lecture, the problem of how a transition from less to more capitalistic methods of production, or *vice versa*, is actually brought about, and what conditions must be fulfilled in order that a new equilibrium may be reached. The first question can be answered immediately: a transition to more (or less) capitalistic methods of production will take place if the total demand for producers' goods (expressed in money¹) increases (or decreases) relatively to the demand for consumers' goods. This may come about in one of two ways: either as a result of changes in the volume of voluntary saving (or its opposite), or as a result of a change in the quantity of money which alters the funds at the disposal of the entrepreneurs for the purchase of producers' goods. Let us first consider the case of changes in voluntary saving, that

¹ For the purposes of this discussion it will be remembered that we are supposing this demand to be expressed in money, but of course this is only a matter of convenience.

is, simple shifts of demand between consumers' goods and producers' goods.

As a starting point, we may take the situation depicted in Fig. 2, and suppose that consumers save and invest an amount of money equivalent to one fourth of their income of one period. We may assume further that these savings are made continuously, exactly as they can be used for building up the new process of production. The proportion of the demand for consumers' goods to the demand for intermediate products will then ultimately be changed from 40:80 to 30:90, or 1:2 to 1:3. The additional amounts of money available for the purchase of intermediate products must now be so applied that the output of consumers' goods may be sold for the reduced sum of thirty now available for that purpose. It should now be sufficiently clear that this will only be the case if the average length of the roundabout processes of production and, therefore, in our instance, also the number of successive stages of production, is increased in the same proportion as the demand for intermediate products has increased relatively to the demand for consumers' goods, i.e., from an average of two to an average of three (or from an actual number of four to an actual number of six) stages of production. When the transition is completed, the structure of production will have changed from that shown in Fig. 2 to the one shown in Fig. 3. (It should be remembered that the relative magnitudes in the two figures are values expressed in money and not physical quantities, that

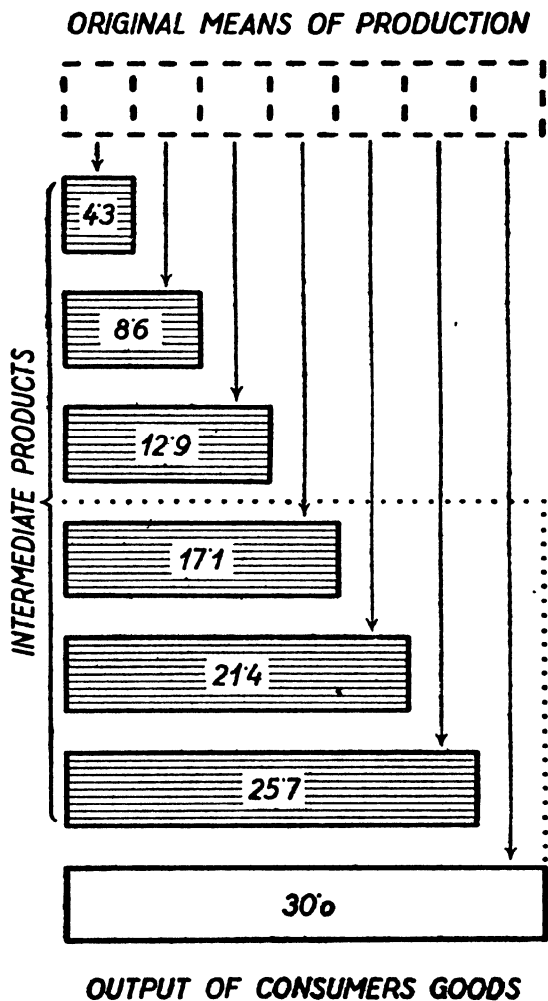


Fig. 3

the amount of original means of production used has remained the same, and that the amount of money in circulation and its velocity of circulation are also supposed to remain unchanged.)

If we compare the two diagrams, we see at once that the nature of the change consists in a stretching of the money stream flowing from the consumers' goods to the original means of production. It has, so to speak, become longer and narrower. Its breadth at the bottom stage, which measures the amount of money spent during a period of time on consumers' goods and, at the same time, the amount of money received as income in payment for the use of the factors of production, has permanently decreased from forty to thirty. This means that the price of a unit of the factors of production, the total amount of which (if we neglect the increase of capital) has remained the same, will fall in the same proportion, and the price of a unit of consumers' goods, the output of which has increased as a consequence of the more capitalistic methods of production, will fall in still greater proportion. The amount of money spent in each of the lower stages of production has also decreased, while the amount used in the higher stages has increased, and the total spent on intermediate products has increased also because of the addition of a new stage of production.

Now it should be clear that to this change in the distribution of the amounts of money spent in the different stages of production there will correspond a similar change in the distribution of the total amount

of goods existing at any moment. It should also be clear that the effect thus realised,—given the assumptions we are making,—is one which fulfils the object of saving and investing, and is identical with the effect which would have been produced if the savings were made in kind instead of in money. Whether it has been brought about in the most expeditious way, and whether the price changes which follow from our assumptions provide a suitable stimulus to the re-adjustment are not questions with which we need concern ourselves at this juncture. Our present purpose is fulfilled if we have established, that under the assumptions we have made, the initial variation in the proportional demand for consumers' goods and for intermediate products respectively becomes permanent, that a new equilibrium may establish itself on this basis, and that the fact that the amount of money remains unchanged, in spite of the increase of the output of consumers' goods and of the still greater increase of the total turnover of goods of all kinds and stages, offers no fundamental difficulties to such an increase of production, since total expenditure on the factors of production, or total costs, will still be covered by the sums received out of the sales of consumers' goods.

But now the question arises: does this remain true if we drop the assumptions that the amount of money remains unchanged and that, during the process of production, the intermediate products are exchanged against money at equal intervals of time?

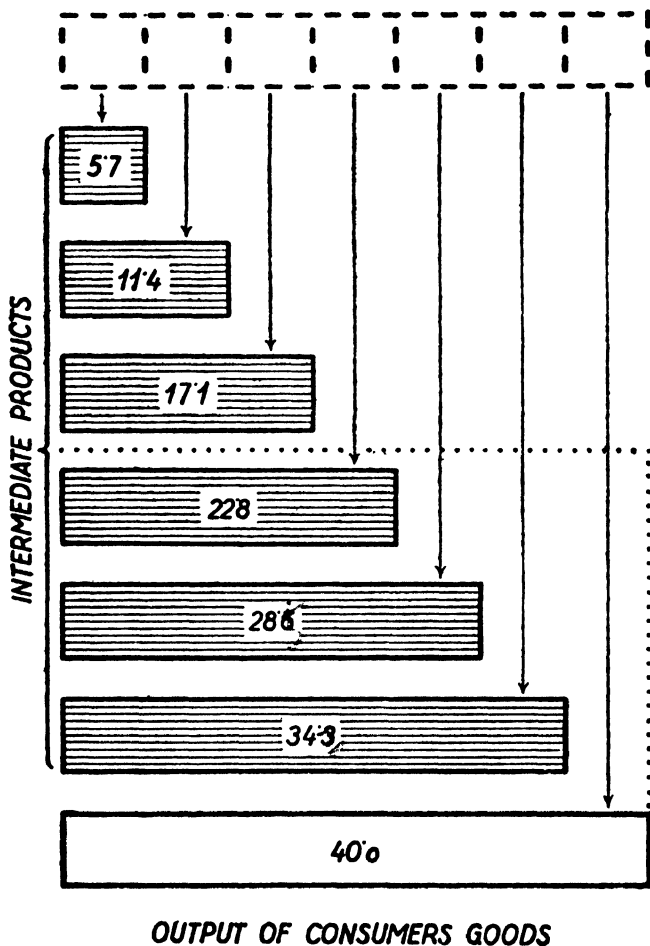
ORIGINAL MEANS OF PRODUCTION

FIG. 4.

(10) Let us begin by investigating the effects of a change in the amount of money in circulation. It will be sufficient if we investigate only the case most frequently to be encountered in practice: the case of an increase of money in the form of credits granted to producers. Again we shall find it convenient to start from the situation depicted in Fig. 2 and to suppose that the same change in the proportion between the demand for consumers' goods and the demand for intermediate products, which, in the earlier instance, was supposed to be produced by voluntary saving, is now caused by the granting of additional credits to producers. For this purpose, the producers must receive an amount of forty in additional money. As will be seen from Fig. 4, the changes in the structure of production which will be necessary in order to find employment for the additional means which have become available will exactly correspond to the changes brought about by saving. The total services of the original means of production will now be expended in six instead of in four periods; the total value of intermediate goods produced in the different stages during a period will have grown to three times instead of twice as large as the value of consumers' goods produced during the same period; and the output of each stage of production, including the final one, measured in physical units will accordingly be exactly as great as in the case represented in Fig. 3. The only difference at first apparent is that the money values of

these goods have grown by one-third compared with the situation depicted in Fig. 3.

There is, however, another and far more important difference which will become apparent only with the lapse of time. When a change in the structure of production was brought about by saving, we were justified in assuming that the changed distribution of demand between consumers' goods and producers' goods would remain permanent, since it was the effect of voluntary decisions on the part of individuals. Only because a number of individuals had decided to spend a smaller share of their total money receipts on consumption and a larger share on production was there any change in the structure of production. And since, after the change had been completed, these persons would get a greater proportion of the increased total real income, they would have no reason again to increase the *proportion* of their money receipts spent for consumption.¹ There would accordingly exist no inherent cause for a return to the old proportions.

In the same way, in the case we are now considering, the use of a larger proportion of the original means of production for the manufacture of intermediate products can only be brought about by a retrenchment of consumption. But now this sacrifice is not voluntary, and is not made by those who will reap the benefit from the new investments. It is made by consumers in general who, because of the increased competition

¹ It is important to bear in mind that, though the total money income would diminish, the total real income would increase.

from the entrepreneurs who have received the additional money, are forced to forego part of what they used to consume. It comes about not because they want to consume less, but because they get less goods for their money income. There can be no doubt that, if their money receipts should rise again, they would immediately attempt to expand consumption to the usual proportion. We shall see in the next lecture why, in time, their receipts will rise as a consequence of the increase of money in circulation. For the moment let us assume that this happens. But if it does, then at once the money stream will be re-distributed between consumptive and productive uses according to the wishes of the individual concerned, and the artificial distribution, due to the injection of the new money, will, partly at any rate, be reversed. If we assume that the old proportions are adhered to, then the structure of production too will have to return to the old proportion, as shown in Fig. 5. That is to say, production will become less capitalistic, and that part of the new capital which was sunk in equipment adapted only to the more capitalistic processes will be lost. We shall see in the next lecture that such a transition to less capitalistic methods of production necessarily takes the form of an economic crisis.

But it is not necessary that the proportion between the demand for consumers' goods and the demand for intermediate products should return exactly to its former dimensions as soon as the injection of new money ceases. In so far as the entrepreneurs

have already succeeded, with the help of the additional money, in completing the new processes of longer duration, they will receive increased money returns

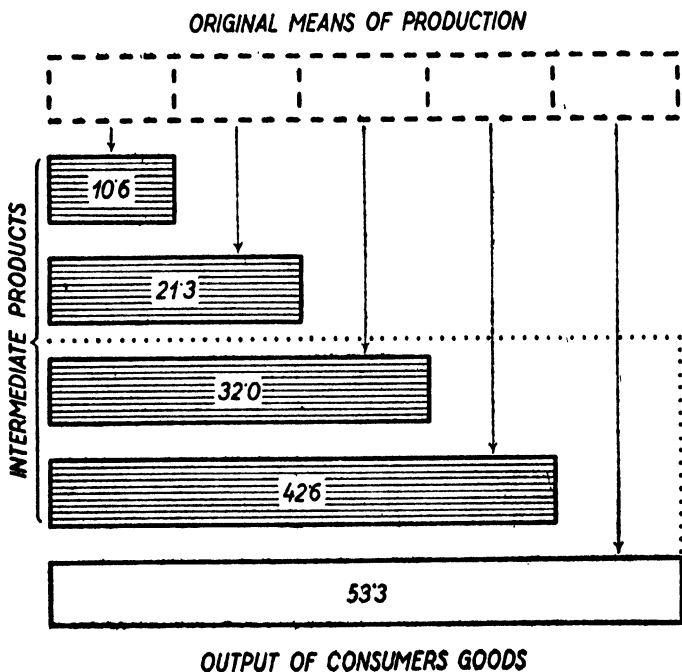


FIG. 5.

for their output which will put them in a position to continue the new processes, i.e., to expend permanently a larger share of their money receipts upon intermediate products without reducing their own consumption.

It is only when the rate of interest for borrowed money rises that these processes too become unprofitable.

But for the producers who have not yet completed the transition to longer roundabout processes when the amount of money ceases to increase the situation is different. They have spent the additional money which put them in a position to increase their demand for producers' goods and in consequence it has become consumers' income ; they will, therefore, no longer be able to claim a larger share of the available producers' goods, and they will accordingly have to abandon the attempt to change over to more capitalistic methods of production.

(II) All this becomes easier to follow if we consider the simpler case in which an increase in demand for consumers' goods of this sort is brought about directly by additional money given to consumers. In recent years, in the United States, Messrs. Foster and Catchings have urged that, in order to make possible the sale of an increased amount of consumers' goods produced with the help of new savings, consumers must receive a proportionately larger money income. What would happen if their proposals were carried out? If we start with the situation which would establish itself as a consequence of new savings if the amount of money remained unchanged (as shown in Fig. 3), and then assume that consumers receive an additional amount of money sufficient to compensate for the relative increase of the demand for intermediate products caused by the savings (i.e., an amount of 15) and spend it

on consumers' goods, we get a situation in which the proportion between the demand for consumers' goods, and the demand for producers' goods, which, in consequence

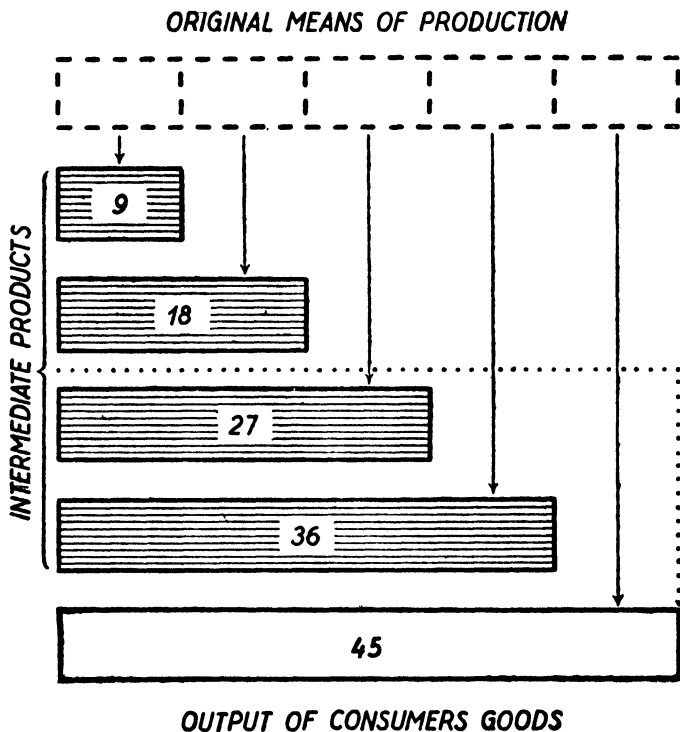


FIG. 6.

of the new savings, had changed from 40:80 to 30:90 or from 1:2 to 1:3 would again be reduced to 45:90 or 1:2. That this would mean a return to the less

capitalistic structure of production which existed before the new savings were made, and that the only effect of such an increase of consumers' money incomes would be to frustrate the effect of saving follows clearly from Fig. 6. (The difference from the original situation depicted in Fig. 2 is again only a difference in money values and not a difference in the physical quantities of goods produced or in their distribution to the different stages of production.)

(12) It is now time to leave this subject and to pass on to the last problem with which I have to deal in this lecture. I wish now to drop the second of my original assumptions, the assumption, namely, that during the process of production the intermediate products are exchanged against money between the firms at successive stages of production in equal intervals. Instead of this very artificial assumption, we may consider two possible alternatives: we may suppose (*a*) that in any line of production the whole process is completed by a single firm, so that no other money payments take place than the payments for consumers' goods and the payments for the use of the factors of production: or we may suppose (*b*) that exchanges or intermediate products take place, but at very irregular intervals, so that in some parts of the process the goods remain for several periods of time in the possession of one and the same firm, while in other parts of the process they are exchanged once or several times during each period.

(13) (*a*) Let us consider first the case in which the whole process of production in any line of production

is completed by a single firm. Once again we may use Fig. 1 to illustrate what happens. In this case the base of the triangle represents the total payments for consumers' goods and the hypotenuse (or, more correctly, its horizontal projection) represents the amounts of money paid for the original means of production used. No other payments would be made and any amount of money received from the sale of consumers' goods could immediately be spent for original means of production. It is of fundamental importance to remember that we can assume only that any *single* line of production is in this way integrated into one big firm. It would be entirely inappropriate in this connection to suppose that the production of *all* goods is concentrated in one enterprise. For, if this were the case, of course the manager of this firm could, like the economic dictator of a communistic society, arbitrarily decide what part of the available means of production should be applied to the production of consumers' goods and what part to the production of producers' goods. There would exist for him no reason to borrow and, for individuals, no opportunity to invest savings. Only if *different* firms compete for the available means of production will saving and investing in the ordinary sense of the word take place, and it is therefore such a situation which we must make the starting point of our investigation.

Now, if any of these integrated industries decides to save and invest part of its profits in order to introduce more capitalistic methods of production, it must

not immediately pay out the sums saved for original means of production. As the transition to more capitalistic methods of production means that it will be longer until the consumers' goods produced by the new process are ready, the firm will need the sums saved to pay wages, etc., during the interval of time between the sale of the last goods produced by the old process, and the getting ready of the first goods produced by the new process. So that, during the whole period of transition, it must pay out less to consumers than it receives in order to be able to bridge the gap at the end of this period, when it has nothing to sell but has to continue to pay wages and rent. Only when the new product comes on the market and there is no need for further saving will it again currently pay out all its receipts.

In this case, therefore, the demand for consumers' goods, as expressed in money, will be only temporarily reduced, while in the case where the process of production was divided between a number of independent stages of equal length, the reduction of the amount available for the purchase of consumers' goods was a permanent one. In the present case, the prices of the consumers' goods will, accordingly, fall only in inverse proportion as their quantity has increased, while the total paid as income for the use of the factors of production will remain the same. These conclusions are, however, only provisional, as they do not take account of the relative position of the one firm considered to all other firms which will certainly

be affected by a change of relative prices and interest rates which are necessarily connected with such a process. Unfortunately, these influences are too complicated to allow of treatment within the scope of these lectures, and I must ask you, therefore, to suspend judgment upon the ultimate effects of the price changes which will take place under these conditions.

But there is one point to which I must particularly direct your attention: The reason in this case why the unchanged amount of money used in production remains sufficient, in spite of the fact that a larger amount of intermediate products now exists, whereas in the former case, the use of an increased amount of intermediate products required the use of an increased quantity of money is this. In the former case the intermediate products passed from one stage of production to the next by an exchange against money. But in the present case this exchange is replaced by internal barter, which makes money unnecessary. Of course, our division of the continuous process of production into separate stages of equal length is entirely arbitrary: it would be just as natural to divide it into stages of different lengths and then speak of these stages as exhibiting so many more or less instances of internal barter. But the procedure which has been adopted serves to bring out a concept, which I shall need in a later lecture, the concept of the relative volume of the flow of goods during any period of time, as compared with the amount of goods exchanged against money

in the same period. If we divide the path traversed by the elements of any good from the first expenditure of original means of production until it gets in the hands of the final consumer into unit periods, and then measure the quantities of goods which pass each of these lines of division during a period of time, we secure a comparatively simple measure of the flow of goods without having recourse to higher mathematics. Thus, we may say that, in the instance we have been considering, money has become more efficient in moving goods, in the sense that a given amount of exchanges against money has now become sufficient to make possible the movement of a greater volume¹ of goods than before.

(14) (*b*) Perhaps this somewhat difficult concept becomes more intelligible if I illustrate it by supposing that two of the independent firms which we have supposed to represent the successive stages of production in our diagrams 2 and 6 are combined into one firm. This is the second of the alternative possibilities I set out to consider. Once this has happened, the passage of the intermediate product from the one to the next stage of production will take place without

¹ Even if this total of goods moving towards consumption during each period is not actually exchanged against money in each period, it is not an imaginary, but a real and important magnitude, since the value of this total is a magnitude which continually rests within our power to determine. It probably stands in close relation to what is commonly called free capital, and it is certainly the supply of this factor which—together with new saving—determines the rate of interest; the capital which remains invested in durable instruments affects the interest rate from the demand side only, i.e., by influencing opportunities for new investment.

money payments being necessary, and the flow of goods from the moment they enter the earlier of the two stages until they leave the later will be effected by so much less money. A corresponding amount of money will thus be released and may be used for other purposes. The reverse effect will, of course, be witnessed if the two firms separate again. An increased amount of money payments will be required to effect the same movement of goods and the proportion of money payments to the flow of goods advancing towards consumption will have increased.

(15) Unfortunately, all names which might be used to designate this kind of monetary effectiveness have already been appropriated for designating different concepts of the velocity of money. Until somebody finds a fitting term, therefore, we shall have to speak somewhat clumsily of the proportion between the amount of goods exchanged against money and the total flow of goods or of the proportion of the total movements of goods which is effected by exchange against money.

Now this proportion must on no account be confused with the proportion of the volume of money payments to the physical volume of trade. The proportion I have in mind may remain the same while the volume of trade increases relatively to the total of money payments and the price level falls, if only the same proportion of the total flow of goods is exchanged against money, and it may change though the proportion of the total of money payments to the

physical volume of trade remains the same. It is, therefore, not necessarily influenced either by changes in the amount of money or by changes in the physical volume of trade; it depends only upon whether, in certain phases of the process of production, goods do or do not change hands.

So far I have illustrated this concept only by instances from the sphere of production. It may be applied also to the sphere of consumption. Here, too, sometimes a larger and sometimes a smaller share of the total output of consumers' goods is exchanged for money before it is consumed. Accordingly, here, too, we may speak about the proportion which the total output of consumers' goods in a period of time bears to the output which is sold for money. And this proportion may be different in the different stages of production. But in its effect upon the structure of production, the efficiency of a given amount of money spent in any stage of production (including the last stage—consumption) is determined by the proportion in that stage; and any change in that proportion has the same effects as an alteration in the amount of money spent in this particular stage of production.

So much for the complications which arise when we drop the assumption that production is carried on in independent stages of equal length. It has been necessary to discuss them here at some length in order to clear the way for an investigation, into which I wish to enter in the last lecture, in connection with the arguments for and against an elastic money supply.

But for the tasks which I shall have to face tomorrow, it will be expedient again to make use of the simplest assumption and to suppose that production is carried on in independent stages of equal length, as we did in our schematic representations, and that this proportion is not only the same in all stages of production, but also that it remains constant over time.

LECTURE III

THE WORKING OF THE PRICE MECHANISM IN THE COURSE OF THE CREDIT CYCLE

"The first effect of the increase of productive activity, initiated by the policy of the banks to lend below the natural rate of interest is . . . to raise the prices of producers' goods while the prices of consumers' goods rise only moderately . . . But soon a reverse movement sets in: prices of consumers' goods rise and prices of producers' goods fall, i.e., the loan rate rises and approaches again the natural rate of interest."

L. V. MISES,

Theorie des Geldes und der Umlaufsmittel, 1912, p. 431.

(1) In the last lecture I dealt with the problems of changes in the structure of production consequent upon any transition to more or less capitalistic methods of production, in terms of the total sums of money available for the purchase of the product of each stage of production. It might seem, therefore, that now I come to the problem of explaining those changes in relative prices which bring it about that goods are directed to new uses—the central problem of these lectures—the explanation should run in terms of sectional price levels, that is to say in terms of changes in the price levels of the goods of the different stages of production. But to do this would mean that at this stage of the explanation I should fall back upon

just that method of using price averages which I condemned at the outset.

At the same time, it should by now be clear that, at this stage of the explanation, a treatment in terms of price averages would not be adequate to our purposes. What we have to explain is why certain goods which have thus far been used in one stage of production can now be more profitably used in another stage of production. Now this will only be the case if there are changes in the proportions in which the different producers' goods may be profitably used in any stage of production, and this in turn implies that there must be changes in the prices they obtain in different stages of production.

(2) At this point, it is necessary to introduce the new distinction between producers' goods to which I alluded in the last lecture: the distinction between producers' goods which may be used in all, or at least, many stages of production, and producers' goods which can be used only in one, or at the most, a few stages of production. To the first class belong not only almost all original means of production, but also most raw materials and even a great many implements of a not very specialised kind—knives, hammers, tongs, and so on. To the second class belong all highly specialised kinds of machinery or complete manufacturing establishments, and also all those kinds of semi-manufactured goods which can be turned into finished goods only by passing a definite number of further stages of production. By adapting a term of von Wieser's, we may call the producers' goods which can

be used only in one or a few stages of production, producers' goods of a specific character, or more shortly "specific" goods, to distinguish them from producers' goods of a more general applicability, which we may call "non-specific" goods.¹ Of course, this distinction is not absolute, in the sense that we are always in a position to say whether a certain good is specific or not. But we should be able to say whether any given good is *more or less* specific as compared with another good.

(3) It is clear that producers' goods which are in different stages of production cannot, for any length of time, bring in different returns or obtain different prices in these different stages. On the other hand, it is no less clear that temporary differences between the prices offered in the different stages of production are the only means of bringing about a shift of producers' goods from one stage to another. If such a temporary difference in the relative attractiveness of the different stages of production arises, the goods in question will be shifted from the less to the more attractive stages until, by the operation of the principle of diminishing returns the differences have been wiped out.

Now, if we neglect the possibility of changes in technical knowledge, which may change the usefulness of any particular producers' goods, it is obvious that the immediate cause of a change in the return obtained

¹ Cf. Friedrich von Wieser, *Social Economics*, translated by A. Ford Hinrichs, New York, 1927, Book I, Chap. 15.

from producers' goods of a certain kind used in different stages of production must be a change in the price of the product of the stage of production in question. But what is it which brings about variations of the relative prices of such products? At first glance it might seem improbable that the prices of the successive stages of one and the same line of production should ever fluctuate relatively to one another because they are equally dependent upon the price of the final product. But, having regard to what was said in the last lecture concerning the possibility of shifts between the demand for consumers' goods and the demand for producers' goods, and the consequent changes in the relation between the amount of original means of production expended and the output of consumers' goods, and how a prolongation of the process of production increases the return from a given quantity of original means of production—this point should present no difficulty.

Now so far I have not expressly referred to the price margins which arise out of these relative fluctuations of the prices of the products of successive stages of production. This has been because I have intentionally neglected interest, or, what amounts to the same thing, I have treated interest as if it were a payment for a definitely given factor of production, like wages or rent. In a state of equilibrium these margins are entirely absorbed by interest. Hence my assumption concealed the fact that the total amount of money received for the product of any stage will regularly

exceed the total paid out for all goods and services used in this stage of production. Yet that margins of this kind must exist is obvious from the consideration that, if it were not so, there would exist no inducement to risk money by investing it in production rather than let it remain idle. To investigate the relationship of these margins to the peculiar advantages of the roundabout methods of production would lead us too far into the problems of the general theory of interest. We must therefore be content to accept it as one of the definite conclusions of this theory that—other things remaining the same—these margins must grow smaller as the roundabout processes of production increase in length and *vice versa*. There is one point, however, which we can not take for granted. The fact that in a state of equilibrium those price margins and the amounts paid as interest coincide does *not* prove that the same will also be true in a period of transition from one state of equilibrium to another. On the contrary, the relation between these two magnitudes must form one of the main objects of our further investigations.

The close interrelation between these two phenomena suggests two different modes of approach to our problem: Either we may start from the changes in the relative magnitude of the demand for consumers' goods and the demand for producers' goods, and examine the effects on the prices of individual goods and the rate of interest; or we may start from the changes in the rate of interest as an immediate effect of the change in the demand for producers' goods and

work up to the changes in the price system which are necessary to establish a new equilibrium between price margins and the rate of interest. It will be found that whichever of these two alternatives we choose as a starting point, our investigation will, in the end, lead us to those aspects of the problem which are the starting point for the other. For the purposes of this lecture, I choose the first as being more in line with my previous argument.

(4) I begin, as I began in the last lecture, with the supposition that consumers decide to save and invest a larger proportion of their income. The immediate effect of the increase in the demand for producers' goods and the decrease in demand for consumers' goods will be that there will be a relative rise in the prices of the former and a relative fall in the prices of the latter. But the prices of producers' goods will not rise equally, nor will they rise without exception. In the stage of production immediately preceding that in which the final touches are given to consumers' goods, the effect of the fall in the prices of consumers' goods will be felt more strongly than the effect of the increase of the funds available for the purchase of producers' goods of all kinds. The price of the product of this stage will, therefore, fall, but it will fall less than the prices of consumers' goods. This means a narrowing of the price margin between the last two stages. But this narrowing of the price margin will make the employment of funds in the last stage less profitable relatively to the higher stages, and therefore some of

the funds which had been used there will tend to be shifted to the higher stages. This shift of funds will tend to narrow the price margins in the preceding stages, and the tendency thus set up towards a cumulative rise of the prices of the products of the higher stages will very soon overcome the tendency towards a fall. In other words, the rise of the price of the product of any stage of production will give an extra advantage to the production of the preceding stage, the products of which will not only rise in price because the demand for producers' goods in general has risen, but also because, by the rise of prices in the preceding stages, profits to be obtained in this stage have become comparatively higher than in the lower stages. The final effect will be that, through the fall of prices in the lower stages of production and the rise of prices in the higher stages of production, price margins between the different stages of production will have decreased all round.

This change of relative prices in the different stages of production must inevitably tend to affect the prospects of profits in the different stages, and this, in turn, will tend to cause changes in the use made of the available producers' goods. A greater proportion of those producers' goods which can be used in different stages of production—the non-specific goods—will now be attracted to the higher stages, where, since the change in the rate of saving, relatively higher prices are to be obtained. And the shifting of goods and services of this type will go on until the diminution

of returns in these stages has equalised the profits to be made in all stages. In the end, the returns and the prices obtained for these goods in the different stages of production will be generally higher and a larger proportion of them will be used in the higher stages of production than before. The general narrowing of the price margins between the stages of production will even make it possible to start production in new and more distant stages which have not been profitable before, and in this way, not only the the average time which elapses between the application of the first unit of original means of production and the completion of the final product, but also the absolute length of the process of production—the number of its stages—will be increased.

But while the effect on the prices of non-specific producers' goods has been a general rise, the effect on the prices of goods of a more specific character—those goods which can only be used in one or a very few stages of production—will be different. If a good of this sort is only adapted to a comparatively low stage of production, the relative deficiency of the non-specific producers' goods required in the same stage of production will lower its return, and if it is itself a product, its production will be curtailed. If, on the other hand, the good belongs to a relatively high stage of production, its price and the amount of it produced will increase. At the same time, the additional stages of production which have been started as a consequence of this transition to more

capitalistic methods of production will probably require new goods of a specific character. Some of these will be new products, some natural resources which formerly it was not profitable to use.

Exactly the reverse of all these changes will take place if the demand for consumers' goods increases relatively to the demand for producers' goods. This will cause not only an increase of the difference between the prices of consumers' goods or products of the last stage of production, and the prices of the products of the previous stage, but also an all round increase of the price margins between the products of the successive stages of production. Prices in the lower stages will rise relatively to prices in the higher stages, producers' goods of a non-specific character will move from the higher stages to the lower, and the goods of specific character in the higher stages of production will lose part of their value or become entirely useless, while those in the lower stages of production will increase in value. I shall discuss certain exceptions to this parallelism later on.

It will, perhaps, facilitate the understanding of these complications if we think of production in its successive stages as a fan, the sticks of which correspond to the prices of the different stages. If more demand is concentrated towards the one extreme—consumers' goods—the fan opens, the differences between the stages become larger, and goods gravitate towards the stages where higher prices are obtained, that is, towards the stages nearer consumption. The

most distant stages are abandoned, and within the remaining stages more goods are concentrated toward the one end. The opening of the price fan is thus accompanied by a reduction of the number of stages of production, i.e., of the number of sticks. If, however, a shift of demand from consumers' goods towards producers' goods takes place, the price fan will close, i.e., the differences between the stages will become smaller and goods will tend to gravitate towards the higher stages where prices are now relatively higher, and new and hitherto unused possibilities of further extension of the process of production will be exploited. The closing of the price fan has brought a greater number of stages of production within the range of practical possibilities and thus initiated the transition to longer roundabout methods of production.

(5) As the initial changes in relative prices which are caused by a change of the relative demand for consumers' goods and producers' goods give rise to a considerable shifting of goods to other stages of production, definite price relationships will only establish themselves after the movements of goods have been completed. For reasons which I shall consider in a moment, this process may take some time and involve temporary discrepancies between supply and demand. But there is one medium through which the expected ultimate effects on relative prices should make itself felt immediately, and which, accordingly, should serve as a guide for the decisions of the individual entrepreneur - the rate of interest on the loan market.

Only in comparatively few cases will the people who have saved money and the people who want to use it in production be identical. In the majority of cases, therefore, the money which is directed to new uses will first have to pass into other hands. The question *who* is going to use the additional funds available for investment in producers' goods will be decided on the loan market. Only at a lower rate of interest than that formerly prevailing will it be possible to lend these funds, and how far the rate of interest will fall will depend upon the amount of the additional funds and the expectation of profits on the part of the entrepreneurs willing to expand their production. If these entrepreneurs entertain correct views about the price changes which are to be expected as a result of the changes in the method of production, the new rate of interest should correspond to the system of price margins which will ultimately be established. In this way, from the outset, the use of the additional funds which have become available will be confined to those entrepreneurs who hope to obtain the highest profits out of their use, and all extensions of production, for which the additional funds would not be sufficient, will be excluded.

(6) The significance of these adjustments of the price mechanism comes out still more clearly when we turn to investigate what happens if the "natural" movement of prices is disturbed by movements in the supply of money, whether by the injection of new money into circulation or by withdrawal of part of

the money circulating. We may again take as our two typical cases, (a) the case of additional money used first to buy producers' goods and (b) the case of additional money used first to buy consumers' goods. The corresponding cases of a diminution of the amount of money we may neglect because a diminution of the demand for consumers' goods would have essentially the same effects as a proportional increase of the demand for producers' goods, and *vice versa*. I have already outlined in the last lecture the general tendencies involved in such cases. My present task is to fill in the details of that rough sketch and to show what happens in the interval before a new equilibrium is attained.

As before, I commence with the supposition that the additional money is injected by way of credits to producers. To secure borrowers for this additional amount of money, the rate of interest must be kept sufficiently below the equilibrium rate to make profitable the employment of just this sum and no more. Now the borrowers can only use the borrowed sums for buying producers' goods, and will only be able to obtain such goods by outbidding the entrepreneurs who used them before. At first sight it might seem improbable that these borrowers who were only put in a position to start longer processes by the lower rate of interest should be able to outbid those entrepreneurs who found the use of those means of production profitable when the rate of interest was still higher. But when it is remembered that the fall in the rate will

also change the relative profitableness of the different factors of production for the existing concerns, it will be seen to be quite natural that it should give a relative advantage to those concerns which use proportionately more capital. Such old concerns will now find it profitable to spend a part of what they previously spent on original means of production, on intermediate products produced by earlier stages of production, and in this way they will release some of the original means of production they used before. The rise in the prices of the original means of production is an additional inducement. Of course it might well be that the entrepreneurs in question would be in a better position to buy such goods even at the higher prices, since they have done business when the rate of interest was higher, though it must not be forgotten that they too will have to do business on a smaller margin. But the fact that certain producers' goods have become dearer will make it profitable for them to replace these goods by others. In particular, the changed proportion between the prices of the original means of production and the rate of interest will make it profitable for them to spend part of what they have till now spent on original means of production on intermediate products or capital. They will, e.g., buy parts of their products which they used to manufacture themselves from another firm, and this now can employ the labour thus dismissed in order to produce these parts on a large scale with the help of new machinery. In other words, those original

means of production and non-specific producers' goods which are required in the new stages of production are set free by the transition of the old concerns to more capitalistic methods which is caused by the increase in the prices of these goods. In the old concerns (as we may conveniently, but not quite accurately, call the processes of production which were in operation before the new money was injected) a transition to more capitalistic methods will take place ; but in all probability it will take place without any change in their total resources : they will invest less in original means of production and more in intermediate products.

Now, contrary to what we have found to be the case when similar processes are initiated by the investment of new savings, this application of the original means of production and non-specific intermediate products to longer processes of production will be effected without any preceding reduction of consumption. Indeed, for a time, consumption may even go on at an unchanged rate after the more roundabout processes have actually started, because the goods which have already advanced to the lower stages of production, being of a highly specific character, will continue to come forward for some little time. But this cannot go on. When the reduced output from the stages of production from which producers' goods have been withdrawn for use in higher stages has matured into consumers' goods, a scarcity of consumers' goods will make itself felt, and the prices of those goods will rise. Had saving preceded

the change to methods of production of longer duration, a reserve of consumers' goods would have been accumulated in the form of increased stocks, which could now be sold at unreduced prices, and would thus serve to bridge the interval of time between the moment when the last products of the shorter old process come on to the market and the moment when the first products of the new longer processes are ready. But as things are, for some time, society as a whole will have to put up with an involuntary reduction of consumption.

But this necessity will be resisted. It is highly improbable that individuals should put up with an unforeseen retrenchment of their real income without making an attempt to overcome it by spending more money on consumption. It comes at the very moment when a great many entrepreneurs know themselves to be in command—at least nominally—of greater resources and expect greater profits. These decisions will not change the amount of consumers' goods immediately available, though it may change their distribution between individuals. But—and this is the fundamental point—*it will mean a new and reversed change of the proportion between the demand for consumers' goods and the demand for producers' goods in favour of the former.* The prices of consumers' goods will therefore rise relatively to the prices of producers' goods. And this rise of the prices of consumers' goods will be the more marked because it is the consequence not only of an increased demand for consumers'

goods but an increase in the demand as measured in money. All this must mean a return to shorter or less roundabout methods of production if the increase in the demand for consumers' goods is not compensated by a further proportional injection of money by new bank loans granted to producers. And at first this is probable. The rise of the prices of consumers' goods will offer prospects of temporary extra profits to entrepreneurs. They will be the more ready to borrow at the prevailing rate of interest. And, so long as the banks go on progressively increasing their loans it will, therefore, be possible to continue the prolonged methods of production or perhaps even to extend them still further. But for obvious reasons the banks cannot continue indefinitely to extend credits; and even if they could, the other effects of a rapid and continuous rise of prices would, after a while, make it necessary to stop this process of inflation.

Let us assume that for some time, perhaps a year or two, the banks, by keeping their rate of interest below the equilibrium rate, have expanded credit, and now find themselves compelled to stop further expansion. What will happen? (Perhaps it should be mentioned at this point that the processes I shall now describe are processes which would also take place if existing capital is encroached upon, or if, in a progressive society, after a temporary increase in saving, the rate should suddenly fall to its former level. Such cases, however, are probably quantitatively less important.)

Now we know from what has been said already that the immediate effect of the banks ceasing to add to their loans is that the absolute increase of the amount of money spent on consumers' goods is no longer compensated by a proportional increase in the demand for producers' goods. The effects of such a change will, therefore, be similar to what would happen in the second case we have to consider, the case of an increase of money by consumers' credits. At this point, accordingly, the two cases can be covered by one discussion.

(7) Speaking generally, it might be said that the effects of a relative increase in the demand for consumers' goods are the reverse of the effects of an increase in the relative demand for producers' goods. There are, however, two important differences which make a detailed account necessary. The first effect of the rise of the prices of consumers' goods is that the spread between them and the prices of the goods of the preceding stage becomes greater than the price margins in the higher stages of production. The greater profits to be obtained in this stage will cause producers' goods in use elsewhere which may be used in this stage to be transferred to it, and the all round increase of price margins between the stages of production which will follow will cause a widespread transfer of non-specific producers' goods to lower stages. The new demand for these goods will cause a relative rise of their prices, and this rise will tend to be considerable because, as we have seen, there will be a temporary

rise in the price of consumers' goods, due to the transient discrepancy between demand and supply, greater than will be the case after the supply of consumers' goods has caught up with demand. These temporary scarcity prices of consumers' goods will, furthermore, have the effect that at first production will tend to shrink to fewer stages than will be necessary after equilibrium prices of consumers' goods have established themselves.

Very soon the relative rise of the prices of the producers' goods will make the longer processes unprofitable. The first effect on these processes will be that the producers' goods of a more specific character, which have become relatively abundant by reason of the withdrawal of the complementary non-specific goods, will fall in price. The fall of the prices of these goods will make their production unprofitable; it will in consequence be discontinued. Goods in the lower stages of production will generally be of a more specific character: the brunt of the price-fall there will therefore be borne by them. It will still pay to employ original factors in these stages. But the fall in the price of intermediate products will be cumulative; and this will mean a fairly sudden stoppage of work in at least all the higher stages of the longer processes.

But while the non-specific goods, in particular the services of workmen employed in those higher stages, have thus been thrown out of use because their amount has proved insufficient and their prices too high for the profitable carrying through of the long processes of

production, it is by no means certain that all those which can no longer be used in the old processes can immediately be absorbed in the short processes which are being expanded. Quite the contrary ; the shorter processes will have to be started at the very beginning and will only *gradually* absorb all the available producer's goods as the product progresses towards consumption and as the necessary intermediate products come forward. So that, while, in the longer processes, productive operations cease almost as soon as the change in relative prices of specific and non-specific goods in favour of the latter and the rise of the rate of interest make them unprofitable, the released goods will find new employment only as the shorter processes are approaching completion. Moreover, the final adaptation will be further retarded by initial uncertainty as regards the methods of production which will ultimately prove profitable once the temporary scarcity of consumers' goods has disappeared. Entrepreneurs, quite rightly, will hesitate to make investments suited to this overshortened process, i.e., investments which would enable them to produce with relatively little capital and a relatively great quantity of the original means of production.

It seems something of a paradox that the self-same goods whose scarcity has been the cause of the crisis would become unsaleable as a consequence of the same crisis. But the fact is that when the growing demand for finished consumers' goods has taken away part of the non-specific producers' goods required,

those remaining are no longer sufficient for the long processes, and the particular kinds of specific goods required for the processes which would just be long enough to employ the total quantity of those non-specific producers' goods do not yet exist. The situation would be similar to that of a people of an isolated island, if, after having partially constructed an enormous machine which was to provide them with all necessities, they found out that they had exhausted all their savings and available free capital before the new machine could turn out its product. They would then have no choice but to abandon temporarily the work on the new process and to devote all their labour to producing their daily food without any capital. Only after they had put themselves in a position in which new supplies of food were available could they proceed to attempt to get the new machinery into operation. In the actual world, however, where the accumulation of capital has permitted a growth of population far beyond the number which could find employment without capital, as a general rule the single workman will not be able to produce enough for a living without the help of capital and he may, therefore, temporarily become unemployable. And the same will apply to all goods and services whose use requires the co-operation of other goods and services which, after a change in the structure of production of this kind, may not be available in the necessary quantity.

(8) Here then we have at last reached an explanation

of how it comes about at certain times that some of the existing resources cannot be used, and how, in such circumstances, it is impossible to sell them at all—or, in the case of durable goods, only to sell them at very great loss. To provide an answer to this problem has always seemed to me the central task of any theory of industrial fluctuations ; and, though at the outset I refused to make the assumption that unused resources exist the basis of my investigation, now that I have presented a tentative explanation of this phenomenon, it seems worth while, rather than spending time filling up the picture of the cycle by elaborating the process of recovery, to devote the rest of this lecture to further discussion of certain important aspects of this problem. Now that we have accounted for the existence of unused resources, we may even go so far as to assume that their existence to a greater or lesser extent is the regular state of affairs save during a boom. And, if we do this, it is imperative to supplement our earlier investigation of the effects of a change in the amount of money in circulation on production, by applying our theory to such a situation. And this extension of our analysis is the more necessary since the existence of unused resources has very often been considered as the only fact which at all justifies an expansion of bank credit.

If the foregoing analysis is correct, it should be fairly clear that the granting of credit to consumers, which has recently been so strongly advocated as a cure for depression, would in fact have quite the

contrary effect ; a relative increase of the demand for consumers' goods could only make matters worse. Matters are not quite so simple so far as the effects of credits granted for productive purposes are concerned. In theory it is at least possible that, during the acute stage of the crisis when the capitalistic structure of production tends to shrink more than will ultimately prove necessary, an expansion of producers' credits might have a wholesome effect. But this could only be the case if the quantity were so regulated as exactly to compensate for the initial, excessive rise of the relative prices of consumers' goods, and if arrangements could be made to withdraw the additional credits as these prices fall and the proportion between the supply of consumers' goods and the supply of intermediate products adapts itself to the proportion between the demand for these goods. And even these credits would do more harm than good if they made roundabout processes seem profitable which, even after the acute crisis had subsided, could not be kept up without the help of additional credits. Frankly, I do not see how the banks can ever be in a position to keep credit within these limits.

And, if we pass from the moment of actual crisis to the situation in the following depression, it is still more difficult to see what lasting good effects can come from credit-expansion. The thing which is needed to secure healthy conditions is the most speedy and complete adaptation possible of the structure of production to the proportion between the demand for

consumers' goods and the demand for producers' goods as determined by voluntary saving and spending. If the proportion as determined by the voluntary decisions of individuals is distorted by the creation of artificial demand, it must mean that part of the available resources is again led into a wrong direction and a definite and lasting adjustment is again postponed. And, even if the absorption of the unemployed resources were to be quickened in this way, it would only mean that the seed would already be sown for new disturbances and new crises. The only way permanently to "mobilise" all available resources is, therefore, not to use artificial stimulants—whether during a crisis or thereafter—but to leave it to time to effect a permanent cure by the slow process of adapting the structure of production to the means available for capital purposes.

(9) And so, at the end of our analysis, we arrive at results which only confirm the old truth that we may perhaps prevent a crisis by checking expansion in time, but that we can do nothing to get out of it before its natural end, once it has come. In the next lecture I shall be dealing with some of the problems connected with a monetary policy suitable for the prevention of crises. Meanwhile, although so far our investigation has not produced a preventive for the recurrence of crises, it has, I hope, at least provided a guide to the maze of conflicting movements during the credit cycle which may prove useful for the diagnosis of the situation existing at any moment. If this is so,

certain conclusions with regard to the methods commonly used in current statistical analysis of business fluctuations seem to follow immediately. The first is that our explanation of the different behaviour of the prices of specific and non-specific goods should help to substitute for the rough empirical classification of prices according to their sensitiveness, a classification based on more rational considerations. The second, that the average movements of general prices show us nothing of the really relevant facts ; indeed, the index-numbers generally used will, as a general rule, fail even to attain their immediate object because, being for practical reasons almost exclusively based on prices of goods of a non-specific character, the data used are never random samples in the sense required by statistical method, but always a biased selection which can only give a picture of the peculiar movements of prices of goods of this class. And the third is that for similar reasons every attempt to find a statistical measure in the form of a general average of the total volume of production, or the total volume of trade, or general business activity, or whatever one may call it, will only result in veiling the really significant phenomena, the changes in the structure of production to which I have been drawing your attention in the last two lectures.

LECTURE IV

THE CASE FOR AND AGAINST AN "ELASTIC" CURRENCY

"The notion common . . . to 90 per cent. of the writings of monetary cranks is that every batch of goods is entitled to be born with a monetary label of equivalent value round its neck, and to carry it round its neck until it dies."

D. H. ROBERTSON,
Economica, No. 23, June, 1928, p. 142.

(1) If the considerations brought forward in the last lecture are at all correct, it would appear that the reasons commonly advanced as a proof that the quantity of the circulating medium should vary as production increases or decreases are entirely unfounded. It would appear rather that the fall of prices proportionate to the increase in productivity, which necessarily follows when, the amount of money remaining the same, production increases, is not only entirely harmless, but is in fact the only means of avoiding misdirections of production. So far as an increase of production caused by a transition to more capitalistic methods of production is concerned, this result bears some resemblance to the theory underlying certain recent plans for stabilising the value of money so as to keep, not the prices of consumers' goods, but incomes, or the prices of the factors of production constant, the prices of consumers' goods being allowed

to fall as costs fall and *vice versa*.¹ In my view—and here no doubt I should part company with the progenitors of these projects—the same conclusion holds true for an increase of production caused by the absorption of unused resources, and that, furthermore, by another chain of reasoning—which is too long and complicated to reproduce here, and which I have sketched elsewhere²—it might be shown to apply in principle even to the particularly difficult case of an increase of production caused by the growth of population, the discovery of new natural resources, and the like. But however that may be, our result is in sufficient contrast to generally received opinions to require further elucidation.

(2) We can best observe how deeply the notion that it is the “natural” thing for the quantity of money to fluctuate with fluctuations in the volume of production is ingrained in the minds of many modern economists if we look at the use they make of it in their theoretical analysis. Professor Cassel, for instance, who is of course the outstanding representative of this point of view, discussing the treatment of price problems³ in a recent article, writes as follows: “The simplest assumption is, then, that a country has a

¹ Cf. The proposal made by Dr. Maurice Leven, mentioned by W. J. King in the *Journal of the American Statistical Association* of March, 1928, Supplement, p. 146, and the article by R. G. Hawtrey in the *Journal of the Royal Statistical Society*, vol. XCIII, Part I, 1930. But the theories are by no means identical.

² In an article, “Das intertemporale Gleichgewichtssystem der Preise und die Bewegungen des ‘Geldwertes,’” *Weltwirtschaftliches Archiv*, vol. 28, July, 1928.

³ *Economic Journal*, vol. 38, December, 1929, p. 589.

paper currency so regulated as to keep the general level of prices constant." And again—to quote another well-known authority—Professor Pigou is expressing the same opinion when he argues¹ that if countries with paper currencies will regulate them with a view to keeping the general price level in some sense stable, there will be no impulses from the side of money which can properly be called "autonomous." Both statements imply that changes in the quantity of the circulating medium which are only just sufficient to keep the general price level steady exert *no* active influence on the formation of prices, and that, accordingly, a money so regulated would remain "neutral" towards prices in the sense in which I have used the word. I see no foundation at all for this hypothesis, although by most it seems to be considered as an obvious platitude requiring no further justification. Everything that has been said in the earlier lectures seems to me to prove that changes in the volume of the circulation which are supposed to be justified by changes in the volume of production will have effects which are just as disturbing as those changes of the circulation which cause changes in the general price level. *Prima facie*, I suggest that we should expect rather that, to be neutral in this sense, the supply of money should be invariable. The question is, can this be true? Are there not many other reasons besides a change in the volume of production which experience suggests justify changes in the quantity of

¹ *Industrial Fluctuations*, second edit., 1929, p. 101.

money in circulation if serious disturbances are to be avoided ?

I suppose that, to most economists, the idea of a circulating medium which does not vary in amount will seem perfectly absurd. We have all been brought up upon the idea that an elastic currency is something highly to be desired, and it is considered a great achievement of modern monetary organisation, particularly of the recent American Federal Reserve system, to have secured it. It does not seem open to doubt that the amount of money necessary to carry on the trade of a country fluctuates regularly with the seasons, and that central banks should respond to these changes in the "demand for money", that not only *can* they do this without doing harm, but that they *must* do so if they are not to incur serious disturbances. It is also a fact which has been established by long experience, that in times of crisis central banks should give increased accommodation and extend thereby their circulation in order to prevent panics, and that they can do it to a great extent without effects which are injurious. How are we to reconcile all this with the conclusions of my earlier lectures ?

(3) To begin with certain terminological elucidations. It should be fairly clear that the magnitude which in the course of my theoretical analysis I have called "quantity of money in circulation" and that commonly referred to under the same name in dealing with the practical problems mentioned before are not identical, but different in two respects. When, in

the course of analysis, I speak of changes in the quantity of money, this is always meant to include that *total* of all kinds of media of exchange (including all so-called "substitutes" for money) used in either a *closed* economic system (i.e. in a country which has no communication with the outside world) or in the world as a whole. But when in dealing with practical problems we speak of the quantity of money in circulation, we always mean the quantity of any particular kind or kinds of media of exchange used within one or several countries which form a part of a larger economic unit. Now, as we shall see, it follows from the definition of the quantity of money in circulation in open communities that the quantity of money thus defined will always be liable to fluctuations even if we suppose that the quantity included in the more comprehensive theoretical concept remains unchanged. It is probably this fact which makes it so difficult even theoretically to conceive the possibility or usefulness of an invariable circulation.

The fact that the monetary circulation of any one country, whatever we include under the heading money, will always show natural fluctuations in conforming with an increase or decrease of the volume of local production is probably the main reason why elasticity is generally considered a self-evident necessity for the amount of money in general. But the question we have to answer is just this. Do the reasons which make fluctuations of the circulation of *any single* country necessary apply when we are considering the

quantity of money as a whole ? ¹ The answer is simple. The increase or decrease of the quantity of money circulating within any one geographical area serves a function just as definite as the increase or decrease of the money incomes of particular individuals, namely the function of enabling the inhabitants to draw a larger or smaller share of the total product of the world. The relative magnitude of the total incomes of all individuals in an "open" community will always stand in a definite proportion to the share of the total product of the world which the people of that community command. And, if the money circulating within that nation regularly increases as a consequence of an increase of its product, this is only one of the steps in the process of adjustment which are necessary to enable that nation to procure a larger portion of the product of the world for itself. What appears to be an *absolute* increase of the amount of money in circulation consequent upon an increase of production, if viewed from the standpoint of a single country, proves to be nothing but a change in the *relative local distribution* of the money of all nations, which is a necessary condition of a change in the distribution of the product of the world as a whole. The same thing would happen, and would be just as necessary to restore equilibrium, if the product of this country were not absolutely increased but the products of all other countries were absolutely diminished. The fact that

¹ For a more detailed discussion of this problem, see my article in the *Weltwirtschaftliches Archiv* (vol. 28), quoted above, sect. 12.

the increase of the product of any one country is regularly accompanied by an increase of the quantity of money circulating there, is therefore not only no proof that the same would be necessary for an isolated community, it rather shows by contrast how useless would be an increase of its monetary circulation either for such a community or for the world as a whole. While for any single country among others an increase of its possession of money is only a means of obtaining more goods, for the world as a whole the increase of the amount of money only means that somebody has to give up part of his additional product to the producers of the new money.

(4) The second source of the prevalent belief that, in order to prevent dislocation, the quantity of the circulating medium must adapt itself to the changing needs of trade arises from a confusion between the demand for *particular kinds of currency* and the demand for money *in general*.¹ This occurs especially in connection with the so-called seasonal variations of the demand for currency which in fact arises because, at certain times of the year, a larger proportion of the total quantity of the circulating medium is required in *cash* than at other times. The regularly recurring increase of the "demand for money" at quarter days, for instance, which has played so great a rôle in discussions of central bank policy since attention was

¹ This confusion is particularly obvious in the writings of Thomas Tooke. Cf. T. E. Gregory, Introduction to Tooke and Newarch's *A History of Prices and of the State of the Circulation*, London, 1928, p. 87 *et seq.*

first drawn to it by the evidence of J. Horsley Palmer and J. W. Gilbart before the parliamentary committees of 1832 and 1841, is mainly a demand to exchange money held in the form of bank deposits into bank notes or coin. The same thing is true in regard to the "increased demand for money" in the last stages of a boom and during a crisis. When, towards the end of a boom period, wages and retail prices rise, notes and coin will be used in proportionately greater amounts, and entrepreneurs will be compelled to draw a larger proportion of their bank deposits in cash than they used to do before. And when, in a serious crisis, confidence is shaken, and people resort to hoarding, this again only means that they will want to keep a part of their liquid resources in cash which they used to hold in bank money, etc. All this does not necessarily imply a change in the total quantity of the circulating medium, if only we make this concept comprehensive enough to comprise everything which serves as money, even if it does so only temporarily.

(5) But at this point we must take account of a new difficulty which makes this concept of the total quantity of the circulating medium somewhat vague, and which makes the possibility of ever actually fixing its magnitude highly questionable. There can be no doubt that besides the regular types of the circulating medium, such as coin, bank notes and bank deposits, which are generally recognised to be money or currency, and the quantity of which is regulated by some central authority or can at least be imagined to be so regulated,

there exist still other forms of media of exchange which occasionally or permanently do the service of money. Now while for certain practical purposes we are accustomed to distinguish these forms of media of exchange from money proper as being mere substitutes for money, it is clear that, *ceteris paribus*, any increase or decrease of these money substitutes will have exactly the same effects as an increase or decrease of the quantity of money proper, and should therefore, for the purposes of theoretical analysis, be counted as money.

In particular, it is necessary to take account of certain forms of credit not connected with banks which help, as is commonly said, to economise money, or to do the work for which, if they did not exist, money in the narrower sense of the word would be required. The criterion by which we may distinguish these circulating credits from other forms of credit which do not act as substitutes for money is that they give to somebody the means of purchasing goods without at the same time diminishing the money spending power of somebody else. This is most obviously the case when the creditor receives a bill of exchange which he may pass on in payment for other goods. It applies also to a number of other forms of commercial credit, as, for example, when book credit is simultaneously introduced in a number of successive stages of production in the place of cash payments, and so on. The characteristic peculiarity of these forms of credit is that they spring up without being subject to any central control, but

once they have come into existence their convertibility into other forms of money must be possible if a collapse of credit is to be avoided. But it is important not to overlook the fact that these forms of credits owe their existence largely to the expectation that it will be possible to exchange them at the banks against other forms of money when necessary, and that, accordingly, they might never come into existence if people did not expect that the banks would in the future extend credit against them. The existence of this kind of demand for more money, too, is therefore no proof that the quantity of the circulating medium must fluctuate with the variations in the volume of production. It is only a proof that once additional money has come into existence in some form or other, *convertibility* into other forms must be possible.

(6) Before proceeding to investigate whether there exist any genuine reasons which would make changes in the amount of the circulation necessary in order to keep money entirely neutral towards the economic process (i.e., to prevent it from exercising any active influence on the formation of prices), it is useful to ask whether, under the circumstances just described, it is at all conceivable that the quantity of the circulating medium *can* be kept invariable, and by what means a monetary authority could attain that end. I may say at once that, in spite of the qualifications that I shall introduce later, this question seems to me not merely a question of theoretical interest, but also a question the answer to which may prove very

important in the shaping of a more rational monetary policy.

The credit system of a country has very often been compared to an inverted pyramid, a simile which serves very well for our purpose. The lowest part of the pyramid corresponds of course to the cash basis of the credit structure. The section immediately above to central bank credit in its various forms, the next part to the credits of commercial banks, and on these finally is built the total of business credits outside the banks. Now it is only in regard to the two lower parts, cash and central bank credit, that an immediate control can be exercised by the central monetary authority. So far as the third part, the credits of the commercial banks, are concerned, it is at least conceivable that a similar control could be exercised. But the uppermost section of the pyramid—private credits—can be controlled only indirectly through a change in the magnitude of their basis, i.e., in the magnitude of bank credit. The essential thing is that the proportion between the different parts of the pyramid is not constant but variable, in other words that the angle at the apex of the pyramid may change. It is a well-known fact that, during a boom, the amount of central bank credits erected upon a given cash basis increases, and likewise the amount of credits of the commercial banks based on a given amount of central bank credit, and even the amount of private credits based on a given amount of central bank credit. This is certainly true on the continent of Europe, where the

possibility of rediscounting takes to a large extent the place of actual cash reserves. So that, even if central banks should succeed in keeping the basis of the credit structure unchanged during an upward swing of a cycle, there can be no doubt that the total quantity of the circulating medium would none the less increase. To prevent expansion, therefore, it would not be sufficient if central banks, contrary to their present practice, refrained from *expanding* their own credits. To compensate for the change in the proportion between the base furnished by the credit and the superstructure erected upon it, it would be necessary for them actually to *contract* credit proportionally. It is probably entirely utopian to expect anything of that kind from central banks so long as general opinion still believes that it is the duty of central banks to accommodate trade and to expand credit as the increasing demands of trade require. Unfortunately, we are very far from the more enlightened times when, as John Fullarton complained, "the words 'demand' and 'legitimate demand' could not even be mentioned in Parliament in connection with this subject unaccompanied by a sneer".¹ None the less, I am strongly convinced that, if we want to prevent the periodic misdirections of production caused by additional credit, something very similar to the policy outlined above, absurd as it may seem to those accustomed to present-day practice, would be necessary.

¹ John Fullarton, *On the Regulation of Currencies*, second edit., London, 1845, p. 206.

I do not delude myself that, in the near future, there will be any opportunity of experimenting with such a policy. But this is no excuse for not following the implications of our theoretical arguments right through to their practical consequences. On the contrary, it is highly important that we should become fully conscious of the enormous difficulties of the problem of the elimination of disturbing monetary influences, difficulties which monetary reformers are always so inclined to underrate. We are still very far from the point when either our theoretical knowledge or the education of the general public provide justification for revolutionary reform or hope of carrying such reforms to a successful conclusion.

(7) As a matter of fact, the course of our argument so far understates rather than overstates the real difficulties. I think that I have shown that changes in the physical volume of production offer no sufficient reason for variations in the supply of money. None the less there do seem to me to exist other causes whose operation may necessitate such changes if the "natural" price system or the equilibrium of the economic process is not to be disturbed. So far, I have been able to neglect these causes, since what I have said has been subject to an assumption, which I expressly introduced at the outset, the assumption, namely, that the proportion between the total flow of goods and the part which takes the form of an exchange against money, or the rate at which goods are exchanged against money,

remains constant. But this assumption must now be removed.

Now it will be remembered that the proportion in question is not necessarily changed by changes in the physical volume of production while the amount of money in circulation remains the same, nor by a variation of the quantity of money in circulation while the physical volume of production, remains the same ; it changes only if movements of goods which before have been effected without the use of money now require the transfer of money, or if movements of goods which before could only be effected by means of money payments can now be effected without the use of money. It will be remembered further that changes in that proportion are caused by certain changes of the business organisation, as the amalgamation of two firms into one, or the division of one firm into two, by the extension of the money economy into spheres where before everybody had only consumed his own product, or where barter had predominated, and the like. The question to which we must now address our attention is this : Will not such changes in the proportions of money transactions to the total flow of goods make a corresponding change in the quantity of the circulating medium necessary ?

The answer to that question depends upon whether, without such a corresponding change in the quantity of money, the change in business organisation would cause shifts in the directions of demand and consequential shifts in the direction of production

not justified by changes in the "real" factors. That the simple fact that a money payment is inserted at a point in the movement of goods from the original means of production to the final stage where none has been necessary before (or the reverse) is no "real" cause in the sense that it would justify a change in the structure of production, is a proposition which probably needs no further explanation. If, therefore, we can show that, without a corresponding change in the amount of the circulation, it has such an effect, this would provide sufficient reason, in these circumstances, to consider a change in the amount of money to be necessary.

(8) Let us examine what happens when a firm which represents two different stages of production, say spinning and weaving, is divided into two independent firms. The movement of the yarn from the spinning to the weaving factory, which before required no money, will now be effected by a purchase against money. The new weaving firm, which before, as part of the larger concern, had to keep money only for the payment of wages, etc., will now require additional money balances to buy the yarns. The new owner, whom we will assume to have bought the weaving mill from the old firm, will therefore need additional capital beyond what was needed to buy the existing plant and equipment and to replace the cash balances kept by the former owner for that mill, in order to effect these new payments. If no new money is added to the amount already circulating, he will either have to take this sum

from other employments where it cannot be replaced, causing an absolute reduction of the demand for capital goods, and consequently a shrinkage of the structure of production ; or he will have to use new savings for that purpose, which would thus cease to be available for lengthening the roundabout processes—that is to say, to use a phrase of Mr. Robertson's, they would become “ abortive ”. The effects would be the same as if, other things remaining the same, the total amount of money in circulation had been reduced by a corresponding sum used before for productive purposes. The two cases are so far alike that the change in the proportion between the demand for consumers' goods and the demand for producers' goods, which in the second case as in the first is not determined by “ real ” causes, will not be permanent : the old proportion will tend to re-establish itself. But if, from the outset, the demand of the new entrepreneur for the additional cash balances had been satisfied by the creation of new money, this change in the total quantity of circulation would not have caused a change in the direction of the demand, and would only have helped to preserve the existing equilibrium.

It would be easy to show, if time permitted, that in the contrary case, the merger of two firms, and in a number of similar changes in business organisation, money is set free and that this money, if not withdrawn from circulation, would have the same effects as if so much money were added to the circulation. But I think that what I have already said on this point will

be sufficient to justify the conclusion that changes in the demand for money caused by changes in the proportion between the total flow of goods to that part of it which is effected by money, or, as we may tentatively call that proportion, of *the co-efficient of money transactions*, should be satisfied by changes in the volume of money if money is to remain neutral towards the price system and the structure of production.

All this assumes a greater importance if we remember that this co-efficient of money transactions may not only change in time, but that, at the same moment of time, it may be different in different parts of an economic system, for instance because goods change hands at shorter intervals in the lower stages of production than they do in the higher stages. If this is the case, any transfer of money from one part of the economic system to another or from one stage of production to another where the co-efficient of money transactions is different will also make a corresponding change of the amount of money in circulation necessary. If, for instance, money is transferred from a lower to a higher stage of production where the interval between two successive stages is twice as long, and, accordingly, only half as much money is needed to hold the same quantity of goods in that stage, half the money so transferred would become free. In the opposite case an addition of new money of an equal amount would be necessary. In such a situation, therefore, the transition to more or less capitalistic methods of production may also require a change in the quantity

of money, *not* because the physical magnitude of the goods-stream has changed, but because money has been transferred from a sphere where the co-efficient of money transactions has been higher to one where it is lower, or *vice versa*.

(9) And this is not the only exception to which our original maxim of policy, that the quantity of money should remain invariable, may be deemed to be subject. There is another occasioned by changes which are more familiar. I refer to changes in what is commonly called the velocity of circulation. Up to this point I have treated the quantity of money in circulation and the number of payments effected during a given period of time as equivalent concepts, a method of procedure which implied the assumption that the velocity of circulation is constant. That is to say, the whole of my argument applies directly only to the *amount of payments* made during a period of time. It applies indirectly to the *amount of money* if we assume the "velocity of circulation" to be constant. So long as we make that assumption, or so long as we are speaking only of the volume of payments made during a period of time, the case just discussed seems to me the only exception to the general rule that, in order that money should remain neutral towards prices, the amount of money or the amount of money payments should remain invariable. But the situation becomes different as soon as we take into account the possibility of changes in methods of payment which make it possible for a given amount of money to effect a

larger or smaller number of payments during a period of time than before. Such a change in the "velocity of circulation" has rightly always been considered as equivalent to a change in the amount of money in circulation, and though, for reasons which it would go too far to explain here, I am not particularly enamoured of the concept of an average velocity of circulation¹ it will serve as sufficient justification of the general statement that any change in the velocity of circulation would have to be compensated by a reciprocal change in the amount of money in circulation if money is to remain neutral towards prices.

(10) Even now our difficulties are not at an end. For, in order to eliminate all monetary influences on the formation of prices and the structure of production, it would not be sufficient merely quantitatively to adapt the supply of money to these changes in demand, it would be necessary also to see that it came into the hands of those who actually require it, i.e., to that part of the system where that change in business organisation or the habits of payment had taken place. It is conceivable that this could be managed in the case of an increase of demand. It is clear that it would be still more difficult in the case of a reduction. But quite apart from this particular difficulty which, from the point of view of pure theory, may not prove insuperable, it should be clear that only to satisfy the legitimate demand for money in this sense, and otherwise

¹ Cf. L. v. Mises, *Theorie des Geldes und der Umlaufsmittel*, second edit., München and Leipzig, 1924, p. 111 *et sequ.*

to leave the amount of the circulation unchanged, can never be a practical maxim of currency policy. No doubt the statement as it stands only provides another, and probably clearer, formulation of the old distinction between the demand for additional money as money which is justifiable, and the demand for additional money as capital which is not justifiable. But the difficulty of translating it into the language of practice still remains. The "natural" or equilibrium rate of interest which would exclude all demands for capital which exceed the supply of real capital¹ is incapable of ascertainment, and, even if it were not, it would not be possible, in times of optimism, to prevent the growth of circulatory credit outside the banks.

Hence the only practical maxim for monetary policy to be derived from our considerations is probably the negative one that the simple fact of an increase of production and trade forms no justification for an expansion of credit, and that—save in an acute crisis—bankers need not be afraid to harm production by overcaution, even during times of general depression. Under existing conditions, to go beyond this is out of the question. In any case, it could be attempted only by a central monetary authority for the whole

¹ "Real capital" stands here as the only short (but probably misleading) expression which I can find for that part of the total money stream which is available for the purchase of producers' goods, and which is composed of the regular receipts of the turnover of the existing producers' goods (i.e., in the case of durable goods the reserves accumulated to make up for depreciation) plus new savings.

world : action on the part of a single country would be doomed to disaster. It is probably an illusion to suppose that we shall ever be able entirely to eliminate industrial fluctuations by means of monetary policy. The most we may hope for is that the growing information of the public may make it easier for central banks both to follow a cautious policy during the upward swing of the cycle, and so to mitigate the following depression, and to resist the well-meaning but dangerous proposals to fight depression by " a little inflation."

(11) Anybody who is sceptical of the value of theoretical analysis if it does not result in practical suggestions for economic policy will probably be deeply disappointed by the small return of so prolonged an argument. I do not, however, think that effort spent in clearing up the conditions under which money would remain neutral towards the economic process is useless because these conditions will never be given in the real world. And I would claim for these investigations at least two things. The first is that, as I have said in my first lecture, monetary theory is still so very far from a state of perfection that even some of the most fundamental problems in this field are yet unsolved, that some of the accepted doctrines are of very doubtful validity. This applies in particular to the widespread illusion that we have simply to stabilise the value of money in order to eliminate all monetary influences on production and that, therefore, if the value of money is assumed to be stable, in theoretical analysis, we may treat money as non-existent. I

hope to have shown that, under the existing conditions, money will always exert a determining influence on the course of economic events and that, therefore, no analysis of actual economic phenomena is complete if the rôle played by money is neglected. This means that we have definitely to give up the opinion which is still widely prevalent, that, in the words of John Stuart Mill, "there cannot, in short, be intrinsically a more insignificant thing, in the economy of society, than money" which "like many other kinds of machinery only exerts a distinct and independent influence of its own when it gets out of order".¹ It means also that the task of monetary theory is a much wider one than is commonly assumed; that its task is nothing less than to cover a second time the whole field which is treated by pure theory under the assumption of barter, and to investigate what changes in the conclusions of pure theory are made necessary by the introduction of indirect exchange. The first step towards a solution of this problem is to release monetary theory from the bonds which a too narrow conception of its task has created.

The second conclusion to be drawn from the results of our considerations follows from the first: So long as we do not see more clearly about the most fundamental problems of monetary theory and so long as no agreement is reached on the essential theoretical questions, we are also not yet in a position drastically

¹ J. S. Mill, *Principles of Political Economy*, Book III, Chap. VII, para. 3, ed. Ashley, p. 488.

to reconstruct our monetary system, in particular to replace the existing semi-automatic gold standard by a more or less arbitrarily managed currency. Indeed, I am afraid that, in the present state of knowledge, the risks connected with such an attempt are much greater than the harm which is possibly done by the gold standard. I am not even convinced that a good deal of the harm which is just now generally ascribed to the gold standard will not by a future and better informed generation of economists be recognised as a result of the different attempts of recent years to make the mechanism of the gold standard inoperative. And there is still another and perhaps no less important reason why it seems dangerous to me to overstress at the present moment the urgency of a change in our monetary system; it is the danger of diverting public attention from other and more pressing causes of our difficulties. I must say a last word on that point because it will help to prevent a misunderstanding which I am particularly anxious to avoid. Though I believe that recurring business depressions can only be explained by the operation of our monetary institutions, I do not believe that it is possible to explain in this way every stagnation of business. This applies in particular to the kind of prolonged depression through which some European countries are passing to-day. It would be easy to demonstrate by the same type of analysis which I have used in the last two lectures that certain kinds of State action, by causing a shift in demand from producers'

goods to consumers' goods, may cause a continued shrinking of the capitalist structure of production, and therefore prolonged stagnation. This may be true of increased public expenditure in general or of particular forms of taxation or particular forms of public expenditure. In such cases, of course, no tampering with the monetary system can help. Only a radical revision of public policy can provide the remedy.

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