Chapter 14

THE CLASSICAL THEORY OF THE RATE OF INTEREST

I

What is the classical theory of the rate of interest? It is something upon which we have all been brought up and which we have accepted without much reserve until recently. Yet I find it difficult to state it precisely or to discover an explicit account of it in the leading treatises of the modern classical school.[1]

It is fairly clear, however, that this tradition has regarded the rate of interest as the factor which brings the demand for investment and the willingness to save into equilibrium with one another. Investment represents the demand for investible resources and saving represents the supply, whilst the rate of interest is the 'price' of investible resources at which the two are equated. Just as the price of a commodity is necessarily fixed at that point where the demand for it is equal to the supply, so the rate of interest necessarily comes to rest under the play of market forces at the point where the amount of investment at that rate of interest is equal to the amount of saving at that rate.

The above is not to be found in Marshall's *Principles* in so many words. Yet his theory seems to be this, and it is what I myself was brought up on and what I taught for many years to others. Take, for example, the following passage from his *Principles*: 'Interest, being the price paid for the use of capital in any

[1] See the Appendix to this chapter for an abstract of what I have been able to find.

market, tends towards an equilibrium level such that the aggregate demand for capital in that market, at that rate of interest, is equal to the aggregate stock forthcoming at that rate'.[1] Or again in Professor Cassel's *Nature and Necessity of Interest* it is explained that investment constitutes the 'demand for waiting' and saving the 'supply of waiting', whilst interest is a 'price' which serves, it is implied, to equate the two, though here again I have not found actual words to quote. Chapter vi of Professor Carver's *Distribution of Wealth* clearly envisages interest as the factor which brings into equilibrium the marginal disutility of waiting with the marginal productivity of capital.[2] Sir Alfred Flux (*Economic Principles*, p. 95) writes: 'If there is justice in the contentions of our general discussion, it must be admitted that an automatic adjustment takes place between saving and the opportunities for employing capital profitably...Saving will not have exceeded its possibilities of usefulness...so long as the rate of net interest is in excess of zero.' Professor Taussig (*Principles*, vol. ii. p. 29) draws a supply curve of saving and a demand curve representing 'the diminishing productiveness of the several instalments of capital', having previously stated (p. 20) that 'the rate of interest settles at a point where the marginal productivity of capital suffices to bring out the marginal instalment of saving'.[3] Walras, in

[1] Cf. p. 186 below for a further discussion of this passage.

[2] Prof. Carver's discussion of interest is difficult to follow (1) through his inconsistency as to whether he means by 'marginal productivity of capital' quantity of marginal product or value of marginal product, and (2) through his making no attempt to define quantity of capital.

[3] In a very recent discussion of these problems ('Capital, Time and the Interest Rate', by Prof. F. H. Knight, *Economica*, August 1934), a discussion which contains many interesting and profound observations on the nature of capital, and confirms the soundness of the Marshallian tradition as to the uselessness of the Böhm-Bawerkian analysis, the theory of interest is given precisely in the traditional, classical mould. Equilibrium in the field of capital production means, according to Prof. Knight, 'such a rate of interest that savings flow into the market at precisely the same time-rate or speed as they flow into investment producing the same net rate of return as that which is paid savers for their use'.

Appendix I (III) of his *Éléments d'économie pure*, where he deals with 'l'échange d'épargnes contre capitaux neufs', argues expressly that, corresponding to each possible rate of interest, there is a sum which individuals will save and also a sum which they will invest in new capital assets, that these two aggregates tend to equality with one another, and that the rate of interest is the variable which brings them to equality; so that the rate of interest is fixed at the point where saving, which represents the supply of new capital, is equal to the demand for it. Thus he is strictly in the classical tradition.

Certainly the ordinary man—banker, civil servant or politician—brought up on the traditional theory, and the trained economist also, has carried away with him the idea that whenever an individual performs an act of saving he has done something which automatically brings down the rate of interest, that this automatically stimulates the output of capital, and that the fall in the rate of interest is just so much as is necessary to stimulate the output of capital to an extent which is equal to the increment of saving; and, further, that this is a self-regulatory process of adjustment which takes place without the necessity for any special intervention or grandmotherly care on the part of the monetary authority. Similarly—and this is an even more general belief, even to-day—each additional act of investment will necessarily raise the rate of interest, if it is not offset by a change in the readiness to save.

Now the analysis of the previous chapters will have made it plain that this account of the matter must be erroneous. In tracing to its source the reason for the difference of opinion, let us, however, begin with the matters which are agreed.

Unlike the neo-classical school, who believe that saving and investment can be actually unequal, the classical school proper has accepted the view that they are equal. Marshall, for example, surely believed,

although he did not expressly say so, that aggregate saving and aggregate investment are necessarily equal. Indeed, most members of the classical school carried this belief much too far; since they held that every act of increased saving by an individual necessarily brings into existence a corresponding act of increased investment. Nor is there any material difference, relevant in this context, between my schedule of the marginal efficiency of capital or investment demand-schedule and the demand curve for capital contemplated by some of the classical writers who have been quoted above. When we come to the propensity to consume and its corollary the propensity to save, we are nearer to a difference of opinion, owing to the emphasis which they have placed on the influence of the rate of interest on the propensity to save. But they would, presumably, not wish to deny that the level of income also has an important influence on the amount saved; whilst I, for my part, would not deny that the rate of interest may perhaps have an influence (though perhaps not of the kind which they suppose) on the amount saved *out of a given income.* All these points of agreement can be summed up in a proposition which the classical school would accept and I should not dispute; namely, that, if the level of income is assumed to be given, we can infer that the current rate of interest must lie at the point where the demand curve for capital corresponding to different rates of interest cuts the curve of the amounts saved out of the given income corresponding to different rates of interest.

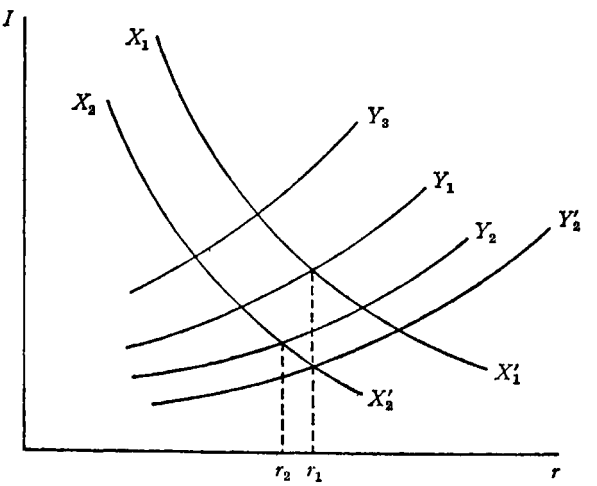
But this is the point at which definite error creeps into the classical theory. If the classical school merely inferred from the above proposition that, given the demand curve for capital and the influence of changes in the rate of interest on the readiness to save out of given incomes, the level of income and the rate of interest must be uniquely correlated, there would be nothing to quarrel with. Moreover, this proposition

would lead naturally to another proposition which embodies an important truth; namely, that, if the rate of interest is given as well as the demand curve for capital and the influence of the rate of interest on the readiness to save out of given levels of income, the level of income must be the factor which brings the amount saved to equality with the amount invested. But, in fact, the classical theory not merely neglects the influence of changes in the level of income, but involves formal error.

For the classical theory, as can be seen from the above quotations, assumes that it can then proceed to consider the effect on the rate of interest of (e.g.) a shift in the demand curve for capital, without abating or modifying its assumption as to the amount of the given income out of which the savings are to be made. The independent variables of the classical theory of the rate of interest are the demand curve for capital and the influence of the rate of interest on the amount saved out of a given income; and when (e.g.) the demand curve for capital shifts, the new rate of interest, according to this theory, is given by the point of intersection between the new demand curve for capital and the curve relating the rate of interest to the amounts which will be saved out of the given income. The classical theory of the rate of interest seems to suppose that, if the demand curve for capital shifts or if the curve relating the rate of interest to the amounts saved out of a given income shifts or if both these curves shift, the new rate of interest will be given by the point of intersection of the new positions of the two curves. But this is a nonsense theory. For the assumption that income is constant is inconsistent with the assumption that these two curves can shift independently of one another. If either of them shift, then, in general, income will change; with the result that the whole schematism based on the assumption of a given income breaks down. The position could only be saved by some

complicated assumption providing for an automatic change in the wage-unit of an amount just sufficient in its effect on liquidity-preference to establish a rate of interest which would just offset the supposed shift, so as to leave output at the same level as before. In fact, there is no hint to be found in the above writers as to the necessity for any such assumption; at the best it would be plausible only in relation to long-period equilibrium and could not form the basis of a short-period theory; and there is no ground for supposing it to hold even in the long-period. In truth, the classical theory has not been alive to the relevance of changes in the level of income or to the possibility of the level of income being actually a function of the rate of the investment.

The above can be illustrated by a diagram[1] as follows:



In this diagram the amount of investment (or saving) I is measured vertically, and the rate of interest r horizontally. X_1X_1' is the first position of the investment demand-schedule, and X_2X_2' is a second position of this curve. The curve Y_1 relates the

[1] This diagram was suggested to me by Mr R. F. Harrod. Cf. also a partly similar schematism by Mr D. H. Robertson, *Economic Journal*, December 1934, p. 652.

amounts saved out of an income Y_1 to various levels of the rate of interest, the curves Y_2, Y_3, etc., being the corresponding curves for levels of income Y_2, Y_3, etc. Let us suppose that the curve Y_1 is the Y-curve consistent with an investment demand-schedule X_1X_1' and a rate of interest r_1. Now if the investment demand-schedule shifts from X_1X_1' to X_2X_2', income will, in general, shift also. But the above diagram does not contain enough *data* to tell us what its new value will be; and, therefore, not knowing which is the appropriate Y-curve, we do not know at what point the new investment demand-schedule will cut it. If, however, we introduce the state of liquidity-preference and the quantity of money and these between them tell us that the rate of interest is r_2, then the whole position becomes determinate. For the Y-curve which intersects X_2X_2' at the point vertically above r_2, namely, the curve Y_2, will be the appropriate curve. Thus the X-curve and the Y-curves tell us nothing about the rate of interest. They only tell us what income will be, if from some other source we can say what the rate of interest is. If nothing has happened to the state of liquidity-preference and the quantity of money, so that the rate of interest is unchanged, then the curve Y_2' which intersects the new investment demand-schedule vertically below the point where the curve Y_1 intersected the old investment demand-schedule will be the appropriate Y-curve, and Y_2' will be the new level of income.

Thus the functions used by the classical theory, namely, the response of investment and the response of the amount saved out of a given income to change in the rate of interest, do not furnish material for a theory of the rate of interest; but they could be used to tell us what the level of income will be, given (from some other source) the rate of interest; and, alternatively, what the rate of interest will have to be, if the level of income is to be maintained at a given figure (e.g. the level corresponding to full employment).

The mistake originates from regarding interest as the reward for waiting as such, instead of as the reward for not-hoarding; just as the rates of return on loans or investments involving different degrees of risk, are quite properly regarded as the reward, not of waiting as such, but of running the risk. There is, in truth, no sharp line between these and the so-called 'pure' rate of interest, all of them being the reward for running the risk of uncertainty of one kind or another. Only in the event of money being used solely for transactions and never as a store of value, would a different theory become appropriate.[1]

There are, however, two familiar points which might, perhaps, have warned the classical school that something was wrong. In the first place, it has been agreed, at any rate since the publication of Professor Cassel's *Nature and Necessity of Interest*, that it is not certain that the sum saved out of a given income necessarily increases when the rate of interest is increased; whereas no one doubts that the investment demand-schedule falls with a rising rate of interest. But if the Y-curves and the X-curves both fall as the rate of interest rises, there is no guarantee that a given Y-curve will intersect a given X-curve anywhere at all. This suggests that it cannot be the Y-curve and the X-curve alone which determine the rate of interest.

In the second place, it has been usual to suppose that an increase in the quantity of money has a tendency to reduce the rate of interest, at any rate in the first instance and in the short period. Yet no reason has been given why a change in the quantity of money should affect either the investment demand-schedule or the readiness to save out of a given income. Thus the classical school have had quite a different theory of the rate of interest in volume I dealing with the theory of value from what they have had in volume II dealing with the theory of money. They have seemed un-

[1] Cf. chapter 17 below.

disturbed by the conflict and have made no attempt, so far as I know, to build a bridge between the two theories. The classical school proper, that is to say; since it is the attempt to build a bridge on the part of the neo-classical school which has led to the worst muddles of all. For the latter have inferred that there must be *two* sources of supply to meet the investment demand-schedule; namely, savings proper, which are the savings dealt with by the classical school, *plus* the sum made available by any increase in the quantity of money (this being balanced by some species of levy on the public, called 'forced saving' or the like). This leads on to the idea that there is a 'natural' or 'neutral'[1] or 'equilibrium' rate of interest, namely, that rate of interest which equates investment to classical savings proper without any addition from 'forced savings'; and finally to what, assuming they are on the right track at the start, is the most obvious solution of all, namely, that, if the quantity of money could only be kept *constant* in all circumstances, none of these complications would arise, since the evils supposed to result from the supposed excess of investment over savings proper would cease to be possible. But at this point we are in deep water. 'The wild duck has dived down to the bottom—as deep as she can get—and bitten fast hold of the weed and tangle and all the rubbish that is down there, and it would need an extraordinarily clever dog to dive after and fish her up again.'

Thus the traditional analysis is faulty because it has failed to isolate correctly the independent variables of the system. Saving and investment are the determinates of the system, not the determinants. They are the twin results of the system's determinants, namely, the propensity to consume, the schedule of the marginal efficiency of capital and the rate of interest. These

[1] The 'neutral' rate of interest of contemporary economists is different both from the 'natural' rate of Böhm-Bawerk and from the 'natural' rate of Wicksell.

determinants are, indeed, themselves complex and each is capable of being affected by prospective changes in the others. But they remain independent in the sense that their values cannot be inferred from one another. The traditional analysis has been aware that saving depends on income but it has overlooked the fact that income depends on investment, in such fashion that, when investment changes, income must necessarily change in just that degree which is necessary to make the change in saving equal to the change in investment.

Nor are those theories more successful which attempt to make the rate of interest depend on 'the marginal efficiency of capital'. It is true that in equilibrium the rate of interest will be equal to the marginal efficiency of capital, since it will be profitable to increase (or decrease) the current scale of investment until the point of equality has been reached. But to make this into a theory of the rate of interest or to derive the rate of interest from it involves a circular argument, as Marshall discovered after he had got half-way into giving an account of the rate of interest along these lines.[1] For the 'marginal efficiency of capital' partly depends on the scale of current investment, and we must already know the rate of interest before we can calculate what this scale will be. The significant conclusion is that the output of new investment will be pushed to the point at which the marginal efficiency of capital becomes equal to the rate of interest; and what the schedule of the marginal efficiency of capital tells us, is, not what the rate of interest is, but the point to which the output of new investment will be pushed, given the rate of interest.

The reader will readily appreciate that the problem here under discussion is a matter of the most fundamental theoretical significance and of overwhelming practical importance. For the economic principle,

[1] See the Appendix to this chapter.

on which the practical advice of economists has been almost invariably based, has assumed, in effect, that, *cet. par.*, a decrease in spending will tend to lower the rate of interest and an increase in investment to raise it. But if what these two quantities determine is, not the rate of interest, but the aggregate volume of employment, then our outlook on the mechanism of the economic system will be profoundly changed. A decreased readiness to spend will be looked on in quite a different light if, instead of being regarded as a factor which will, *cet. par.*, increase investment, it is seen as a factor which will, *cet. par.*, diminish employment.

Appendix to Chapter 14

APPENDIX ON THE RATE OF INTEREST IN MARSHALL'S *PRINCIPLES OF ECONOMICS*, RICARDO'S *PRINCIPLES OF POLITICAL ECONOMY*, AND ELSEWHERE

I

There is no consecutive discussion of the rate of interest in the works of Marshall, Edgeworth or Professor Pigou,—nothing more than a few *obiter dicta*. Apart from the passage already quoted above (p. 139) the only important clues to Marshall's position on the rate of interest are to be found in his *Principles of Economics* (6th edn.), Book VI. p. 534 and p. 593, the gist of which is given by the following quotations:

'Interest, being the price paid for the use of capital in any market, tends towards an equilibrium level such that the aggregate demand for capital in that market, at that rate of interest, is equal to the aggregate stock[1] forthcoming there at that rate. If the market, which we are considering, is a small one—say a single town, or a single trade in a progressive country—an increased demand for capital in it will be promptly met by an increased supply drawn from surrounding districts or trades. But if we are considering the whole world, or even the whole of a large country, as one market for capital, we cannot regard the aggregate supply of it as altered quickly and to a considerable extent by a change in the rate of interest. For the general fund of capital is the product of labour and waiting; and the extra

[1] It is to be noticed that Marshall uses the word 'capital' not 'money' and the word 'stock' not 'loans'; yet interest is a payment for borrowing *money*, and 'demand for capital' in this context should mean 'demand for loans of money for the purpose of buying a stock of capital-goods'. But the equality between the stock of capital-goods offered and the stock demanded will be brought about by the *prices* of capital-goods, not by the rate of interest. It is equality between the demand and supply of loans of money, i.e. of debts, which is brought about by the rate of interest.

work,[1] and the extra waiting, to which a rise in the rate of interest would act as an incentive, would not quickly amount to much, as compared with the work and waiting, of which the total existing stock of capital is the result. An extensive increase in the demand for capital in general will therefore be met for a time not so much by an increase of supply, as by a rise in the rate of interest;[2] which will cause capital to withdraw itself partially from those uses in which its marginal utility is lowest. It is only slowly and gradually that the rise in the rate of interest will increase the total stock of capital' (p. 534).

'It cannot be repeated too often that the phrase "the rate of interest" is applicable to old investments of capital only in a very limited sense.'[3] For instance, we may perhaps estimate that a trade capital of some seven thousand millions is invested in the different trades of this country at about 3 per cent net interest. But such a method of speaking, though convenient and justifiable for many purposes, is not accurate. What ought

[1] This assumes that income is *not* constant. But it is not obvious in what way a rise in the rate of interest will lead to 'extra work'. Is the suggestion that a rise in the rate of interest is to be regarded, by reason of its increasing the attractiveness of working in order to save, as constituting a sort of increase in real wages which will induce the factors of production to work for a lower wage? This is, I think in Mr D. H. Robertson's mind in a similar context. Certainly this 'would not quickly amount to much'; and an attempt to explain the actual fluctuations in the amount of investment by means of this factor would be most unplausible, indeed absurd. My rewriting of the latter half of this sentence would be: 'and if an extensive increase in the demand for capital in general, due to an increase in the schedule of the marginal efficiency of capital, is *not* offset by a rise in the rate of interest, the extra employment and the higher level of income, which will ensue as a result of the increased production of capital-goods, will lead to an amount of extra waiting which in terms of money will be exactly equal to the value of the current increment of capital-goods and will, therefore, precisely provide for it'.

[2] Why not by a rise in the supply price of capital-goods? Suppose, for example, that the 'extensive increase in the demand for capital in general' is due to a *fall* in the rate of interest. I would suggest that the sentence should be rewritten: 'In so far, therefore, as the extensive increase in the demand for capital-goods cannot be immediately met by an increase in the total stock, it will have to be held in check for the time being by a rise in the supply price of capital-goods sufficient to keep the marginal efficiency of capital in equilibrium with the rate of interest without there being any material change in the scale of investment; meanwhile (as always) the factors of production adapted for the output of capital-goods will be used in producing those capital-goods of which the marginal efficiency is greatest in the new conditions.'

[3] In fact we cannot speak of it at all. We can only properly speak of the rate of interest on *money* borrowed for the purpose of purchasing investments of capital, new or old (or for any other purpose).

to be said is that, taking the rate of net interest on the investments of new capital in each of those trades [i.e. on marginal investments] to be about 3 per cent; then the aggregate net income rendered by the whole of the trade-capital invested in the various trades is such that, if capitalised at 33 years' purchase (that is, on the basis of interest at 3 per cent), it would amount to some seven thousand million pounds. For the value of the capital already invested in improving land or erecting a building, in making a railway or a machine, is the aggregate discounted value of its estimated future net incomes [or quasi-rents]; and if its prospective income-yielding power should diminish, its value would fall accordingly and would be the capitalised value of that smaller income after allowing for depreciation' (p. 593).

In his *Economics of Welfare* (3rd edn.), p. 163, Professor Pigou writes: 'The nature of the service of "waiting" has been much misunderstood. Sometimes it has been supposed to consist in the provision of money, sometimes in the provision of time, and, on both suppositions, it has been argued that no contribution whatever is made by it to the dividend. Neither supposition is correct. "Waiting" simply means postponing consumption which a person has power to enjoy immediately, thus allowing resources, which might have been destroyed, to assume the form of production instruments[1]...The unit of "waiting" is, therefore, the use of a given quantity of resources[2]—for example, labour or machinery—for a given time...In more general terms we may say that the unit of waiting is a year-value-unit, or, in the simpler, if less accurate, language of Dr Cassel, a year-pound...A caution may be added against the common view that the amount of capital accumulated in any year is necessarily equal to the amount of "savings" made in it. This is not so, even when savings are interpreted to mean net savings, thus eliminating the savings of one man that are lent to increase the consumption of another, and when temporary accumulations of *unused* claims upon services in the form of bank-money are ignored; for many savings which are meant to become capital

[1] Here the wording is ambiguous as to whether we are to infer that the postponement of consumption *necessarily* has this effect, or whether it merely releases resources which are then either unemployed or used for investment according to circumstances.

[2] Not, be it noted, the amount of money which the recipient of income might, but does not, spend on consumption; so that the reward of waiting is not interest but quasi-rent. This sentence seems to imply that the released resources are necessarily *used*. For what is the reward of waiting if the released resources are left unemployed?

in fact fail of their purpose through misdirection into wasteful uses.'[1]

Professor Pigou's only significant reference to what determines the rate of interest is, I think, to be found in his *Industrial Fluctuations* (1st edn.), pp. 251–3, where he controverts the view that the rate of interest, being determined by the general conditions of demand and supply of real capital, lies outside the central or any other bank's control. Against this view he argues that: 'When bankers create more credit for business men, they make, in their interest, subject to the explanations given in chapter xiii. of part i.,[2] a forced levy of real things from the public, thus increasing the stream of real capital available for them, and causing a fall in the real rate of interest on long and short loans alike. It is true, in short, that the bankers' rate for money is bound by a mechanical tie to the real rate of interest on long loans; but it is not true that this real rate is determined by conditions wholly outside bankers' control.'

My running comments on the above have been made in the footnotes. The perplexity which I find in Marshall's account of the matter is fundamentally due, I think, to the incursion of the concept 'interest', which belongs to a monetary economy, into a treatise which takes no account of money. 'Interest' has really no business to turn up at all in Marshall's *Principles of Economics*,—it belongs to another branch of the subject.

[1] We are not told in this passage whether net savings would or would not be equal to the increment of capital, if we were to ignore misdirected investment but were to take account of 'temporary accumulations of *unused* claims upon services in the form of bank-money'. But in *Industrial Fluctuations* (p. 22) Prof. Pigou makes it clear that such accumulations have no effect on what he calls 'real savings'.

[2] This reference (*op. cit.* pp. 129–134) contains Prof. Pigou's view as to the amount by which a new credit creation by the banks increases the stream of real capital available for entrepreneurs. In effect he attempts to deduct 'from the floating credit handed over to business men through credit creations the floating capital which would have been contributed in other ways if the banks had not been there'. After these deductions have been made, the argument is one of deep obscurity. To begin with, the rentiers have an income of 1500, of which they consume 500 and save 1000; the act of credit creation reduces their income to 1300, of which they consume $500-x$ and save $800+x$; and x, Prof. Pigou concludes, represents the net increase of capital made available by the act of credit creation. Is the entrepreneurs' *income* supposed to be swollen by the amount which they *borrow* from the banks (after making the above deductions)? Or is it swollen by the amount, i.e. 200, by which the rentiers' income is reduced? In either case, are they supposed to save the whole of it? Is the increased investment equal to the credit creations *minus* the deductions? Or is it equal to x? The argument seems to stop just where it should begin.

Professor Pigou, conformably with his other tacit assumptions, leads us (in his *Economics of Welfare*) to infer that the unit of waiting is the same as the unit of current investment and that the reward of waiting is quasi-rent, and practically never mentions interest,—which is as it should be. Nevertheless these writers are not dealing with a non-monetary economy (if there is such a thing). They quite clearly presume that money is used and that there is a banking system. Moreover, the rate of interest scarcely plays a larger part in Professor Pigou's *Industrial Fluctuations* (which is mainly a study of fluctuations in the marginal efficiency of capital) or in his *Theory of Unemployment* (which is mainly a study of what determines changes in the volume of employment, assuming that there is no involuntary unemployment) than in his *Economics of Welfare*.

II

The following from his *Principles of Political Economy* (p. 511) puts the substance of Ricardo's theory of the rate of interest:

'The interest of money is not regulated by the rate at which the Bank will lend, whether it be 5, 3 or 2 per cent., but by the rate of profit which can be made by the employment of capital, and which is totally independent of the quantity or of the value of money. Whether the Bank lent one million, ten millions, or a hundred millions, they would not permanently alter the market rate of interest; they would alter only the value of the money which they thus issued. In one case, ten or twenty times more money might be required to carry on the same business than what might be required in the other. The applications to the Bank for money, then, depend on the comparison between the rate of profits that may be made by the employment of it, and the rate at which they are willing to lend it. If they charge less than the market rate of interest, there is no amount of money which they might not lend;—if they charge more than that rate, none but spendthrifts and prodigals would be found to borrow of them.'

This is so clear-cut that it affords a better starting-point for a discussion than the phrases of later writers who, without really departing from the essence of the Ricardian doctrine, are nevertheless sufficiently uncomfortable about it to seek refuge in haziness. The above is, of course, as always with Ricardo, to be interpreted as a long-period doctrine, with the emphasis on the word 'permanently' half-way through the passage; and it is interesting to consider the assumptions required to validate it.

Once again the assumption required is the usual classical assumption, that there is always full employment; so that, assuming no change in the supply curve of labour in terms of product, there is only one possible level of employment in long-period equilibrium. On this assumption with the usual *ceteris paribus*, i.e. no change in psychological propensities and expectations other than those arising out of a change in the quantity of money, the Ricardian theory is valid, in the sense that on these suppositions there is only one rate of interest which will be compatible with full employment in the long period. Ricardo and his successors overlook the fact that even in the long period the volume of employment is not necessarily full but is capable of varying, and that to every banking policy there corresponds a different long-period level of employment; so that there are a number of positions of long-period equilibrium corresponding to different conceivable interest policies on the part of the monetary authority.

If Ricardo had been content to present his argument solely as applying to any given quantity of money created by the monetary authority, it would still have been correct on the assumption of flexible money-wages. If, that is to say, Ricardo had argued that it would make no permanent alteration to the rate of interest whether the quantity of money was fixed by the monetary authority at ten millions or at a hundred millions, his conclusion would hold. But if by the policy of the monetary authority we mean the terms on which it will increase or decrease the quantity of money, i.e. the rate of interest at which it will, either by a change in the volume of discounts or by open-market operations, increase or decrease its assets—which is what Ricardo expressly does mean in the above quotation—then it is not the case either that the policy of the monetary authority is nugatory or that only one policy is compatible with long-period equilibrium; though in the extreme case where money-wages are assumed to fall without limit in face of involuntary unemployment through a futile competition for employment between the unemployed labourers, there will, it is true, be only two possible long-period positions—full employment and the level of employment corresponding to the rate of interest at which liquidity-preference becomes absolute (in the event of this being less than full employment). Assuming flexible money-wages, the quantity of money as such is, indeed, nugatory in the long period; but the terms on which the monetary authority will change the quantity of money enters as a real determinant into the economic scheme.

It is worth adding that the concluding sentences of the quotation suggest that Ricardo was overlooking the possible changes in the marginal efficiency of capital according to the amount invested. But this again can be interpreted as another example of his greater internal consistency compared with his successors. For if the quantity of employment and the psychological propensities of the community are taken as given, there is in fact only one possible rate of accumulation of capital and, consequently, only one possible value for the marginal efficiency of capital. Ricardo offers us the supreme intellectual achievement, unattainable by weaker spirits, of adopting a hypothetical world remote from experience as though it were the world of experience and then living in it consistently. With most of his successors common sense cannot help breaking in—with injury to their logical consistency.

III

A peculiar theory of the rate of interest has been propounded by Professor von Mises and adopted from him by Professor Hayek and also, I think, by Professor Robbins; namely, that changes in the rate of interest can be identified with changes in the relative price levels of consumption-goods and capital-goods.[1] It is not clear how this conclusion is reached. But the argument seems to run as follows. By a somewhat drastic simplification the marginal efficiency of capital is taken as measured by the ratio of the supply price of new consumers' goods to the supply price of new producers' goods.[2] This is then identified with the rate of interest. The fact is called to notice that a fall in the rate of interest is favourable to investment. *Ergo*, a fall in the ratio of the price of consumers' goods to the price of producer's goods is favourable to investment.

By this means a link is established between increased saving by an individual and increased aggregate investment. For it is common gound that increased individual saving will cause a fall in the price of consumers' goods, and, quite possibly, a

[1] *The Theory of Money and Credit*, p. 339 *et passim*, particularly p. 363.

[2] If we are in long-period equilibrium, special assumptions might be devised on which this could be justified. But when the prices in question are the prices prevailing in slump conditions, the simplification of supposing that the entrepreneur will, in forming his expectations, assume these prices to be permanent, is certain to be misleading. Moreover, if he does, the prices of the existing stock of producers' goods will fall in the same proportion as the prices of consumers' goods.

greater fall than in the price of producers' goods; hence, according to the above reasoning, it means a reduction in the rate of interest which will stimulate investment. But, of course, a lowering of the marginal efficiency of particular capital assets, and hence a lowering of the schedule of the marginal efficiency of capital in general, has exactly the opposite effect to what the above argument assumes. For investment is stimulated either by a *raising* of the schedule of the marginal efficiency or by a *lowering* of the rate of interest. As a result of confusing the marginal efficiency of capital with the rate of interest, Professor von Mises and his disciples have got their conclusions exactly the wrong way round. A good example of a confusion along these lines is given by the following passage by Professor Alvin Hansen:[1] 'It has been suggested by some economists that the net effect of reduced spending will be a lower price level of consumers' goods than would otherwise have been the case, and that, in consequence, the stimulus to investment in fixed capital would thereby tend to be minimised. This view is, however, incorrect and is based on a confusion of the effect on capital formation of (1) higher or lower prices of consumers' goods, and (2) a change in the rate of interest. It is true that in consequence of the decreased spending and increased saving, consumers' prices would be low relative to the prices of producers' goods. But this, in effect, means a lower rate of interest, and a lower rate of interest stimulates an expansion of capital investment in fields which at higher rates would be unprofitable.'

[1] *Economic Reconstruction*, p. 233.