A Reconsideration of the Austrian Theory of Industrial Fluctuations

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I

THE Austrian Theory of Industrial Fluctuations has lately been under a cloud.[1] By 1940, its most faithful adherents have to admit to themselves that few of the high hopes it held out in the halcyon days of the early 1930's have been fulfilled. To some extent this is, of course, due to the erstwhile ascendancy of the doctrines of Mr. Keynes and his followers, and although this is but a negative reason, it is probably the one that would readily occur to three out of four present-day economists.

It is probable, however, that to the historian of the future this ascendancy will be less of a problem than it is to some contemporaries of ours. For, when the history of economic thought in the second quarter of the twentieth century comes to be written, it will have become clearer than it is now that Mr. Keynes' theory—so far from being "general" —derives its fascination for the present generation of economists mainly from the fact that it is a most vivid description of a peculiar historical situation, an impressive picture of our world. In this disordered world the institutional and political framework of economic progress has broken down and in the resulting international chaos the capitalistically most advanced countries find it impossible to fulfil their natural function of assisting the economic development of the more backward parts of the world. The economic theorist of sterling purity, who in constructing his models chooses to ignore all this, may then, of course, summarise this situation by speaking of a "lack of investment opportunities"!

[1] The present paper contains results of an investigation into problems of secondary depressions which the author undertook as Leon Fellow of the University of London during 1939–40.

Reasons more positive—and of less ephemeral value—for the temporary eclipse of the Austrian theory may have to be sought in the manner of its first presentation and the intellectual milieu of its protagonists. Its theoretical pedigree was Wicksellian, and Wicksell's major claim to fame was to have linked the Böhm-Bawerkian theory of capital to the Walrasian equilibrium system. Hence, recent attacks on the former could not but affect its apparent derivative in the field of industrial fluctuations, while the charge of assuming "Full Employment" from the outset appeared no less serious a gravamen to a generation to which the monthly unemployment figures had become an integral part of its acquaintance with economic life.

Of both these charges Professor Hayek has now effectively disposed.[1] And if it could be hoped that the major obstacles to a more general understanding of the theory were thus removed, we might well leave matters at that. The only justification we have to offer for reconsidering the theory in the light of certain of its dynamic aspects consists in that we are unable to entertain any such hopes. For it seems to us that in the discussion about the Austrian theory "The Structure of Production" and "Full Employment" have received an altogether exaggerated attention, and that those who rejected it did so mainly because of its apparently too static character. It is curious to observe how the very same people would then wholeheartedly subscribe to another doctrine which, although at heart far more static than the Austrian, succeeded in conveying a distinctly dynamic impression, with all its static characteristics carefully tucked away.

In spite of this we believe that the reluctance with which the Austrian theory has met so far is actually due less to its being too static than to the fact that the mind of our generation, impregnated with static equilibrium notions, is incapable of realising its real dynamic significance.

In what follows we shall try, first to re-state what to us appear to be the essentials of the Austrian Theory of Industrial Fluctuations, a theory about the effects of cyclical fluctuations on the inter-industrial relationships between prices, profits and real wages. At the end of this paper we shall briefly confront this theoretical construction of ours with whatever knowledge we may be able to glean

[1] F. A. von Hayek: *Profits, Interest and Investment*, London, 1939.

from trade cycle history in order to test its relevance to different periods of cyclical fluctuations. We hope to show that the Austrian theory is essentially dynamic, and we believe that any appearance to the contrary in its first presentation was really due to the upbringing of its protagonists to whom Walrasian equilibrium conditions appeared as the natural jumping-off ground for all excursions into the real world. We believe it to be vital to a correct understanding of the Austrian theory to stress its dynamic features and, in particular, to point out that certain of its assumptions, which have caused in the past and are likely to continue to cause much misunderstanding and bewilderment, have to be interpreted as symbols of a world of change.

That the Austrian theory does not readily fit into a static equilibrium system is easily seen, albeit in a very general and simplified manner, if we bear in mind that while *reversibility* is of the essence of the latter, the Austrian theory rests fundamentally upon the non-reversibility of the investment operation. Once " free Capital " has been converted into buildings and machinery, any failure of events to conform to expectations will upset everything.

We do not revert to our initial position, but are worse off than we would have been had we never departed from it. For all static equilibrium analysis, on the other hand, it is essential that every deviation from the equilibrium point will set in motion forces which will lead us back to this point.

If the foregoing is thought to afford some justification for a reconsideration of the case, there are two special reasons why the present moment appears particularly propitious for this endeavour. On the one hand, the recent publication of Professor Schumpeter's *Business Cycles*[1] will no doubt rekindle interest in the dynamics of the process of capitalistic evolution, and his concept of " Innovation ", as we shall see, provides us with a most valuable tool of analysis. By its help, we shall try to explain the peculiar function of the capital-goods-industries in a world of change. On the other hand, in the new version of the Austrian theory real wages begin to fall at the moment that " Full Employment " is reached.[2]

[1] J. A. Schumpeter: *Business Cycles*, 2 vols. McGraw-Hill, New York. 1939.

[2] F. A. von Hayek: *Profits, Interest and Investment*. London. 1939. p. 11. The description of the point at which scarcities begin to make themselves felt as one of " Full Employment " seems to us most unfortunate. As will be seen presently, what is meant is Full Capacity (of first-line equipment) rather than Full Employment of Labour. Its theoretical significance consists in that it is the point at which cost curves begin to slope upward.

This result, at first sight rather astonishing, is based on the assumption of an intercyclical increase in the productivity of Labour so that in successive cycles identical output quantities are produced by less and less Labour, and "Full Capacity" may mean considerably less than "Full Employment". Here again the theory requires dynamic interpretation.

It goes without saying that if in what follows we endeavour to set forth what to us appear to be the essentials of the Austrian theory, we are acting entirely on our own responsibility. As long as thought is free, there is no guarantee whatsoever that, because some men's ideas coincide at some moment, they will do so at the next. By the same token, "schools of thought" lead a precarious life. At best of a transitory nature, they grow and wither as the human spirit moves.

We earnestly believe that what we have to say will be unobjectionable to all who are counted among the Austrian School, but we may well be wrong. We shall try to present the doctrine in such a way as will safeguard it against most of the attacks to which so far it has been exposed, but here we may well fail. In the end the reader will have to judge for himself whether he is able to recognise in our sketch essential features of the world in which we are living.

II

In this and the following sections we shall state our assumptions regarding the structure of the industrial system and the relations between the various factors of production. Thereafter we shall study the cyclical process, i.e. our system in motion, and at the end of the paper make a brief attempt at verification.

In every economic system in which the division of Labour has reached a certain stage it is possible to distinguish:

(1) industries producing consumers' goods,

(2) industries producing the equipment for the production of the former,

(3) industries producing raw materials.

For the sake of brevity we shall speak of C-, E-, and R-industries. But in a progressive economy there will exist a further group of industries, the special function of which

is the provision of the means for progress. And in an economy that is liable to change there will have to be industries providing the means for change.

Our first task consists in convincing the reader that Growth is but one aspect of Innovation and that therefore the industries providing the means for both will be identical. There is little we have to add to Professor Schumpeter's brilliant analysis of the problems of industrial change. It is, of course, the fashion to-day to describe all dynamic phenomena in terms of aggregate quantities (like investment, incomes, output) and to regard Growth as an upward movement of a system of variables interpreted as the response of the system to changes in external conditions, say population. As such an attitude is only too prevalent among contemporary economists it is necessary for us to insist that there is no such thing as "natural Growth" and that a casual glance at the economic history of countries like India and China is sufficient to make us understand that industrial Growth is the outcome of conscious and sustained human effort about which "dynamic equations" tell us less than nothing. Growth then is the cumulative effect of individual efforts directed towards the improvement of the productive apparatus of society.

To deny that the results of these efforts can be adequately described in dynamic equations is, however, not the same as to ignore the effects they may have on the structure and composition of the economic system by stimulating some industries while thwarting others. On the contrary, it would be true to say that the Austrian theory is a theory about the inter-industrial effects of certain dynamic processes.

In a progressive economy it is usually possible to discern industries which are particularly sensitive to enterpreneurial efforts towards change and innovation. We might call them "dynamic key industries" and shall refer to them as K-industries. If the reader is satisfied that Growth does not just consist in aggregate quantities sliding harmoniously upwards along an imaginary "trend", he will have made the first step towards understanding why the demand for the products of these industries is unlikely to be closely geared to that for consumers' goods.

Our next step consists in showing that "capital-intensification" or the "deepening of capital" is merely another

form of Innovation. Once we have rid ourselves of the notion of capital as a homogeneous aggregate and bear in mind its essentially heterogeneous character as an agglomeration of houses, ships, machinery, etc., it is easy to see that "an increase of capital per unit of output" does not just mean the addition of another piece of machinery to an otherwise unchanged equipment park, but that as often as not it will entail a complete re-arrangement of the existing productive apparatus, including depreciation of specific factors, and possibly a change in the character of the final product. This is but another way of saying that the "deepening of capital" is a non-reversible process by which the conditions of production are definitely changed.

For our purpose what matters is that the industries which in a progressive economy provide the means for capital-intensification are identical with those providing the means for changes in production in general (i.e. under modern conditions the "heavy" industries producing iron and steel). In economic history, as a matter of fact, it is often virtually impossible to distinguish between the one and the other: the evolution of the railways can be described either as the production of an entirely new service or else as capital-intensification of the pre-existing transport system. The same applies to electrification.

III

Furthermore, we shall assume that labour in each of the industries described above is homogeneous—which does not, however, exclude differences between average and marginal product where homogeneous labour co-operates with equipment of different quality—but that it is not mobile between industries. In other words, labour in each industry is a non-competing group.

Furthermore, we are assuming a fairly rapid intercyclical increase in the productivity of labour as a result of technical progress. Thus we shall expect to see in successive cycles physically identical output quantities produced either by a steadily diminishing labour force or in shorter working weeks or by a combination of both.

Let us now analyse our system in terms of complementarity and competitiveness. Broadly speaking, consumers' goods industries (C), equipment goods industries (E), and raw

material producers (R) are complementary in the sense that, on the whole, a change in demand for C will entail a corresponding change in demand for the other two. As to our dynamic key-industries (K), they certainly compete for raw materials with C and E. But what determines the demand for K-products? Is K-output complementary to or competitive with the output of C and E? It is impossible to answer this question straight away, yet it is on this answer, as we shall see, that the issue between the Austrians and their opponents ultimately turns.

There is no prima facie reason for a belief that demand for the products of our K-industries must be closely linked to that for consumption goods. It is true that these industries are partly engaged in building up new C-industries, but just because the latter are new, their demand schedules are unknown and it is in no way possible to deduce such schedules for particular industries from any general demand function. Demand for K-products depends thus largely on expectations regarding a distant, unknown and uncertain future. We only know two factors which are most likely to have a decisive influence on it:

(1) The relationship between present costs and expected future yield. "The rate of interest relates a future income stream to a present capital outlay. With a given rate of interest, the investor's decision depends on the cost of this present outlay and the size of the expected future income stream, i.e. he has to compare a present outlay exclusively determined by the present level of costs and prices with an expected income stream which . . . is unlikely to be affected by this at all. It follows that, in the case of durable investment, the average yield of which is independent of present conditions, a rise in costs will check the inducement to invest and vice versa."[1]

In referring to this factor we shall speak of the *Lundberg effect*.[2]

(2) Real Wages. By the real wage paid in an industry we mean the ratio between money wage and price of the product of the industry. Real wages in different industries may hence be expected to be different. The higher the

[1] L. M. Lachmann, "Investment and Costs of Production," *American Economic Review*, XXVIII (1938), p. 475.

[2] Erik Lundberg: *Studies in the Theory of Economic Expansion* (Stockholm Economic Series, 1937), p. 230. Dr. Lundberg, it is true, relates receipts to the rate of interest only. But, as the present author has shown (*l. c.*, p. 475), it is easy to extend the theorem so as to cover costs other than interest.

real wage in an industry the stronger is the urge to substitute labour-saving machinery and to increase the amount of capital per unit of output. Equally, where real wages are low, they will set up a tendency to diminish the amount of capital per unit of output and to turn over capital more quickly. In referring to this factor we shall speak of the *Ricardo effect.*[1]

From all this it follows that if our two factors were moving together, if real wages were to increase at the same time that investment costs rise relatively to future yields, this would tend to stabilise our system. For it would mean that while one source of demand for capital goods which is particularly sensitive to the cost-yield ratio became exhausted, another one—demand for labour-saving machinery —would help to maintain the level of investment activity. This is what, prima facie, we should expect to happen during the later stages of prosperity: While raw material prices soar and their forward quotations begin to display ominous " backwardations ", will not the point of Full Employment be approached ? Unfortunately, in our economic system this is unlikely to be the case owing to the intercyclical increase of the productivity of labour. There is no reason to believe that in an economy such as ours the introduction of labour-saving machinery has to wait for Full Employment to become profitable. Moreover, inspection of British and American statistics for the 1920's and 1930's suggests considerable increases in the productivity of Labour at considerably less than Full Employment.[2] In this case, unless there has been a corresponding increase in equipment, Full Capacity will be reached before Full Employment. Hence, real wages will begin to fall at exactly the moment that the boom gets under way, and the Ricardo effect will come into play. As the percentage of profit per unit of output rises, it will pay to turn over capital more quickly rather than to invest it for longer periods. Hence, the dynamic relationship between real wages and the cost-yield ratio typical of our world has a strong destabilising effect

[1] F. A. von Hayek: *Profits, Interest and Investment*, pp. 8–10.

[2] For Great Britain:

G. L. Schwartz and E. C. Rhodes: *Output, Employment and Wages in the United Kingdom*, 1924, 1930, 1935. (London and Cambridge Economic Service, Special Memorandum No. 47). See in particular the Introduction by Professor A. L. Bowley.

For the United States:

D. Weintraub: *Technological Trends and National Policy* (National Resources Committee, Washington, 1937).

on investment. And it is rather cold comfort for us to learn that once the system has slid into the phase of recession the improvement in the cost-yield ratio as well as the rise in real wages will both come to our help and tend to arrest the downward process. By 1940 we have all learned that an "elastic" monetary system is likely to engender forces which, once our mechanism is set on its downward course, are apt to push it further and further.

The cyclical effect on employment of the intercyclical increase in the productivity of labour will, however, be modified to the extent to which an increase in equipment and output will absorb unemployed. Now, statistical evidence goes to show that years of rapid increase in the productivity of labour are usually also years of heavy capital accumulation. Yet, for several reasons it must appear very doubtful whether such investment can actually have a compensatory effect on unemployment. In this context it is of utmost importance to realise that not *all* investment, but only *some* investment, can have such mitigating effects.

First, even where the increase in the productivity of labour is merely the outcome of capital intensification[1] in the "classical" sense, i.e. an increase in capital per unit of output which leaves the existing productive apparatus unaffected, as much new capital as is necessary in order to produce the same output with less labour can have no compensatory effect on unemployment. Only investment in excess of this quantity can have such an effect.

Secondly, in most cases the increase in the productivity of labour is, of course, due to "technical progress", with or without a change in the ratio between capital and output. In this case new investment will be necessary in order to replace the whole set of existing machinery, unless the new equipment is only gradually introduced as the old wears out. But this piecemeal procedure is unlikely to be adopted, partly for economic reasons—because each entrepreneur will strive to be the first in the field—and partly for technical reasons—since a rationalisation plan is an integrated whole that cannot be carried out piecemeal.

[1] The reader will notice that we distinguish between the cyclical and intercyclical aspects of capital intensification. To the former belongs its effect on investment, employment and incomes in K, to the latter its effect on employment in C. In Dr. Hawtrey's terminology, while the effects of capital *being* deepened are confined to the Cycle ("The Short Period") those of capital *having been* deepened extend over a longer period of time. It is only with the latter that we are here concerned.

We may therefore conclude that in the case of "technical progress" only investment beyond the magnitude necessary for the replacement of the existing machinery will be capable of mitigating unemployment.

Third, if in such cases for the reasons just mentioned it is not possible to wait for the existing equipment to wear out before new equipment is installed, it follows that such innovations are bound to leave a backlog of unutilised old equipment to fall back upon—if at higher unit cost—in cases of emergency. Hence, the very fact of a change in the method of production will entail an increase in the capacity to produce output. Every increase in capacity capable of absorbing unemployed would again have to be in excess of this magnitude.

We thus may conclude that from whatever point of view we are looking at our problem, the chances of an early mitigation of technological unemployment must appear to be slender.

IV

Having hitherto studied the elements of our system and the relationships between them, we are now ready to tackle our main task. The stage is set for "The Trade Cycle" to be performed.

Let us assume that in a situation, which cyclically is one of Depression with Unemployment, idle equipment and surplus stocks, an entrepreneur decides to carry out some "Innovation". This is as likely as not to happen in depressions. On the cost side low money wages and costs of building materials will be favourable factors, and on the receipts side we know that the man who plans far ahead cannot take account of cyclical situations, but has to calculate some long run average yield. Whether his innovation be a new consumption good (for which no present demand schedule exists) or an improved method of producing an already existing good (where he is as likely as not to revolutionise the whole market), economic activity devoted to innovation is apt to be but loosely linked to present consumers' demand.

Such entrepreneurial decisions involve increased investment activity, more employment in K-industries and more demand for C-goods. The next step is that C-industries,

which probably so far were unwilling or financially unable to replace their equipment as replacements fell due, will make up for arrears. The delayed replacements will have the same effects on E as an increase in investment; larger orders for E-firms, more employment in E and, hence, increased demand for C-goods. Thus a cumulative process of expansion, once the impact effect has come from K, will begin to work between C and E in a shuttle-like fashion.

It is of some interest to note the relative effects which the upward process is likely to have on E and K. At a first glance it would seem that to the extent to which firms in C are replacing obsolete equipment by other which is more "capital intensive", demand will be deflected from E to K. But, first, even where this is the case, it will not interfere with the working of our process, since any increase in activity in either E or K is investment activity in the sense that it sets the "Multiplier" rolling. In the second place, it is quite unnecessary to assume that K and E are competitive to such a degree that any increase in demand for one spells a fall in demand for the other. The introduction of labour-saving machinery will, of course, give rise to a demand for steel products which otherwise would not have come forward, partly because this is what "an increase in capital per unit of output" means and partly because it is hardly possible that a programme of capital intensification could be realised as gradually as equipment becomes obsolete by age. (In practice, as we pointed out above, every change in methods of production leaves a backlog of unutilised old equipment which, although at peak levels of business one may have to fall back on it, suffers intermittent loss of its capital character.) We must always bear in mind that demand for machinery is produced by capital intensification and that, where firms in C change methods of production, this may, of course, raise awkward problems of adjustment in E; but, on the whole, it means demand for a different type of equipment and not no demand for equipment. In other words, where ordinary replacement means demand for E-products, capital intensification means demand for E- *and* K-products. This holds true whether the initial impact on our system came from a programme of capital intensification, or whether, the *primum agens* being some other type of innovation, capital intensification is "induced" and takes place by way of replacing

obsolete equipment in C. As long as there are ample surplus resources all over the system K and E need not be competitive and may even become complementary.

V

As the process of expansion gets under way, with employment, incomes and consumption all rising *pari passu*, a stage is gradually approached where our K-industries will become competitive with C and E. To indicate this point in that general and abstract manner which is all of which economic theory—at least at our present level of abstraction—is capable, suffice it to say that some resources which enter the output of more than one industrial group must have become scarce.

Why this should have to be a point of "Full Employment" it is difficult to see, unless one either assumes a short-run variability of the coefficients of production which is little short of miraculous or can show reasons why, if this point is reached, labour should be scarcer than equipment. If, however, our account of the intercyclical increase in the productivity of labour is accepted, it will be the other way round: full capacity of (new) equipment will be attained while there is still unemployed labour. It does not, however, follow from our assumptions that, this point being reached, it is *physically* impossible to increase the output of consumption goods. This, of course, will always be possible, if we fall back on antiquated equipment. If, as we pointed out above, the new machinery has not been installed gradually by replacing old equipment, but at one stroke, such a reserve park of obsolete machinery for intermittent use at peak levels of production must exist. What matters to us is that as this less efficient equipment is taken into use again, the marginal product of labour will fall below its average product. Prices will rise and so will profits, while real wages will fall.

We know that a diminution of the stocks of industrial raw materials is a characteristic feature of the upswing.[1] As soon as this phenomenon makes itself felt and raw material prices begin to rise, our K-industries will come under fire from two sides. The combined Lundberg- and

[1] L. M. Lachmann and F. Snapper: "Commodity Stocks in the Trade Cycle," ECONOMICA, Nov., 1938, pp. 445–6.

Ricardo effects will now come into play. For, while in C and E, with the strong pressure of demand for consumption goods, the higher cost of raw materials is easily borne, for K this is by no means so.

We know that for the people on whose demand activity in K mainly depends the higher cost of investment is not offset by a higher price of the product they are selling, as this product mostly belongs to the future. Thus, as the boom is getting under way with prices soaring, there is a weakening of the stimulus to genuine innovation, as distinct from speculation—which by adopting the outer trappings of innovation has only too often snared economic historians and financial journalists alike.

The Ricardo effect, on the other hand, accounts for the simultaneous decline in capital intensification and the increase in all kinds of speculative activity. Little though we know about the cyclical behaviour of stocks of consumers' goods, it seems fairly obvious that if the rate of profit is high, business men will try to turn over their capital as often as they can in the profitable present. They will neglect long-term investment—which means forgoing present profit opportunities for the sake of an uncertain future—and devote themselves to profitable short run operations instead. In an economy without a capital market, where every firm would entirely depend on its own resources without being able either to borrow or to lend, business men would now tend to devote their savings and the amortisation quotas of their fixed capital to reinforcing their circulating capital. In an economy with a fully developed capital market demand for the financing of speculative holdings of commodities and securities will now come to compete with the demand for the finance of innovation and capital intensification. Given the high profitability of the former with rising prices and the declining profitability of the latter because of the Lundberg effect, there can be little doubt what the outcome will be and what type of demand will become extramarginal.

VI

We have thus far endeavoured to present the bare outlines of what to us appears as the main contents of the Austrian Theory of Industrial Fluctuations, up to the preceding paragraph at least, "in real terms". But as

we have already had to bring in the capital market in order to explain the working of the Ricardo effect in an exchange economy, we may just as well go one step further and examine, from the level of insight thus far gained, the cyclical consequences of a "Cheap Money policy".

It appears that, whatever the merits of such a policy in depression or during the early stages of revival, there is one aim it cannot achieve: to maintain the level of investment activity under boom conditions. It may seem that by such a policy we are able to facilitate the financing of long term investment. But, under conditions of scarcity of resources and with rising profits, by holding out the prospect of higher prices we shall add to the bargaining strength of those who seek finance for short term operations, and who compete with long term investors for raw materials. The bargaining position of prospective long-term investors would thus not really improve. Moreover, unless such a policy is also capable of affecting expectations of future yields—for this the elasticity of expectations would have to be unity or more—it cannot but have a detrimental effect on the cost-yield calculations of those entrepreneurs on whom, as we saw, activity in K largely depends. While, as soon as marginal costs in C begin to rise, such a policy is bound to encourage the piling up of stocks of consumable goods—the intertemporal transfer of goods from points of lower to points of higher marginal cost—and other speculative operations of a similar kind at the expense of investment in equipment. Thus real wages will be depressed even further. Nor may we pin our hopes on E to offset the decline of activity in K. Even if marginal costs in E should rise less steeply than in C, E will hardly be able to rescue us from our dilemma. This industry is devoted to the replacement of outworn equipment, and, to a certain extent, to the "linear" extension of existing equipment in C. Hence, all production in E is "gross investment". But, precisely for this reason, every order C gives to E involves the tying up of capital which, under boom conditions, can be employed far more profitably in uses which will yield a quick return. We may thus conclude that, where there are scarce resources, no monetary device will overcome the consequences of the simple fact that the economy as a whole cannot have its cake and eat it.

Before concluding this section we may add a few remarks about the consequences to which our theory leads as to wages and wage policies. This would seem all the more propitious, since it is exactly in this connection that the oddest of misunderstandings arose. By some of its less charitable critics the theory has almost been decried as a " gospel of low wages ".

Now, the first point to be noted in this connection is that the theory, not being of the " macrodynamic " variety, can say nothing about such abstract aggregates as " The Wage Level ". It is obvious, indeed, that a doctrine which derives its significance from the fact that different elements of the economic system are competitive rather than complementary, will have to rely on *differential wage movements* in the different parts of the system.

In C and its ancillary industries changes in the wage unit will, as long as the higher (or lower) wage incomes are wholly spent (or economised) on consumers' goods, not affect the rate of profit, which depends on the ratio of marginal to average cost. Wages in K, since their present and expected future level affects the cost-yield-calculations of our " innovators ", are of cyclical importance and have much the same effects as changes in raw material prices. To this extent it is correct to say that *relative* money wage levels in K and C determine the inducement to invest. But it is not true to say that the Austrian Theory, in order to bring about adjustment after the crisis, advocates a *general* reduction of wages. On the contrary, it is to a *rise of real wages* in C that we have to pin our main hope. For, as consumers' demand declines, real wages will, for the reasons known, rise, unless money wages in C are extremely flexible. And if this rise goes far enough, we may hope it will give a stimulus to renewed capital intensification. On the other hand, a fall in money wage rates in K will, like a fall in raw material prices, reduce the cost of investment and thus improve the cost-yield basis of long-term investment. Thus the Austrian theory does, partly, rely on a stimulus to investment engendered by a fall in wages in cost-sensitive industries (K). But a reduction of money wages in C would only render the situation more difficult, as what matters here is the fall in prices *relatively* to wages. If money wages in C fall, prices will have to fall the more before we can hope for recovery.

VII

We now have to confront our last task in this paper. We shall make a brief attempt to test our theoretical model in the light of historical facts. Needless to say, within the space at our disposal it would be quite impossible to run the whole course of trade cycle history in order to find out whether the Austrian theory "fits the facts". All we can do here is to venture a few very general, and necessarily vague, remarks on the verifiability of our theory. Our conclusions will be seen to contain nothing startling and will possibly disappoint readers who cling to a belief in the infallibility of time series.

It seems to us that, broadly speaking, the Austrian theory when confronted with evidence gathered from nineteenth century fluctuations, comes out very well indeed. We now have Professor Schumpeter's excellent testimony as to the course of American events in the twenties and thirties of last century,[1] and we see no difficulty in interpreting most of the business fluctuations which accompanied the construction of railroads on both sides of the Atlantic in terms of our model. If we learn that the inability of railway share subscribers to pay the full amount of their instalments was one of the outstanding features of the British crisis of 1847,[2] what else does it mean but that railway promoters had grossly overrated consumers' willingness and ability to save and that, in real terms, more resources had been devoted to long-term investment than consumers' preferences would warrant? If, as Professor Schumpeter points out,[3] American railroad promoters, confronted with the same dilemma, were "in every major instance" only rescued by the timely arrival of European--mostly English—capital, what else can we infer but that the mobile resources of the American economy—raw materials and consumption goods —were insufficient to carry the burden of as large an investment activity as the railroad plans involved, and that a large rise in imports from Europe was needed in order to bridge the gap? Moreover, whatever price and commodity stock data we have for the period seem to indicate that, in every major instance of a breakdown,

[1] J. A. Schumpeter: *Business Cycles*, 2 vols. New York. 1939. Vol. I, p. 296, footnote.
[2] E. V. Morgan: "Railway Investment, Bank of England Policy and Interest Rates, 1844–48," *Economic History*, February, 1940, pp. 331–34.
[3] J. A. Schumpeter, *op. cit.*, p. 335.

scarcity of resources (industrial raw materials) did actually exist.[1]

But we must admit that as an explanation of the crisis of 1929 and of the developments leading up to it our model does not fare so well. To all our knowledge there is no evidence to suggest that the economic evolution of the 1920's was stopped short by scarcity of resources. We shall not dwell upon the continued existence, in Britain and the United States, of unemployment throughout this period, for, as was shown above, where industrial productivity increases rapidly, unemployment is not inconsistent with a strain on resources (the combination of labour with equipment under conditions of non-optimum cost). More important as a symptom of the absence of any such strain is, of course, the stationary behaviour of consumption goods prices between 1924 and 1929. But what we should regard as most significant in this connection, since it stands in open contradiction to all our other experience, is the increase in raw material stocks after 1925.[2]

It is thus not easy to account for the crisis of 1929 by the help of the Austrian theory. We may infer that the economic conditions of the 1920's must have been very different from those on which our model is based. It is hardly possible for us, in this context, to go beyond the stage of tentative suggestion. All we can do is to hint at two facts which appear to us to be germane to the issue.

First, the evolution of the automobile has changed the economic function of the "heavy" metal industries. In the ages of railroad construction and electrification the cyclical position of these industries corresponded, more or less, to that of our K-industries. Demand for their products was not geared to that for consumers' goods, and a sufficient degree of competitiveness existed within the system. The evolution of the automobile, the demand for which is so largely dependent on consumers' incomes,[3] has changed this. Thanks to it, the iron and steel industries have to-day adopted the character of E-industries in the sense of our model.

[1] L. M. Lachmann and F. Snapper: "Commodity Stocks in the Trade Cycle," ECONOMICA, November, 1938, p. 436, Table I.

[2] L. M. Lachmann and F. Snapper, *op. cit.*, p. 437, Table II.

[3] *The Dynamics of Automobile Demand*, published by General Motors Corporation, New York, 1939.

Second, where much of the investment activity of the upswing is directed towards increasing the production and productivity of raw materials, there need be no scarcity of them. There can be little doubt that between 1920 and 1930 the production of most industrial raw materials underwent revolutionary innovations,[1] mostly of the capital intensification kind (e.g. tin dredging and the selective flotation process for copper and zinc) and that the rise in raw material stocks was largely consequent upon these changes in productive technique. An industrial society which increases the output of industrial raw materials and lays in a handsome stock of them *before* setting itself to the task of making available more and better consumption goods is acting as prudently as an agricultural community which will not release half of its labour force for the construction of a bridge before a stock of grain which is sufficient to maintain them during their absence from primary production has been piled up

We are inclined to think that such a society would, indeed, be relatively immune against the type of crisis that has been sketched out in this paper. Yet, as we had to learn to our grief, not even such prudence will protect us from other calamities of a dynamic world. The extreme complexity of such a world in which almost any constellation of circumstances is capable, without notice, of giving rise to destructive forces, defies all facile generalisations. What chances of success under the circumstances all attempts at "social planning" that are based on such facile generalisations are likely to have is one of the melancholy reflections which, by 1940, the student of economics cannot eschew.

[1] Melvin T. Copeland: *A Raw Commodity Revolution.* Harvard Business Research Studies, Nr. 19.