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A Review Article

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The study of the causes of the "economic progress of nations" had been a central concern of the Classical Economists, a "grand theme" which pervaded all of their efforts at systematic economic analysis, though with different emphases and results as between the leading representatives: Smith, Malthus, and Ricardo. Marx took over this concern and transformed it into a study of the "economic laws of motion" of the capitalist economy, viewed as a historically specific system of social relations driven by its own logic to undergo internal transformation and eventual supersession. After Marx, serious analysis and speculation on these questions subsided, while the content and focus of economic analysis took a sharp turn with the rise of neoclassical Marginalism and the accompanying retreat of the Historical School into Historism. A long hiatus thus existed until the appearance of Schumpeter's work, which stands out for the singularity of its analytical concern with the dynamic processes of the capitalist economy at a time of almost complete neglect by his contemporaries.

In the immediate post-World-War-II period, there occurred a revival of interest in these matters, stimulated by a conjuncture of circumstances: the recent experience of a major economic crisis in the world capitalist system, the problems of post-war reconstruction in the

leading capitalist countries, the call for political independence and economic development in the underdeveloped regions, and the economic transformations taking place in the socialist world. As one of the main theoretical outcomes of this revival we were treated to a succession of theorems about how countries could achieve a state of "bliss" if only they employed the "golden rule" ^{or} and followed the appropriate "turnpike" of maximum growth in their strategy of economic development.¹ It is a tribute to the sterility of this particular line of theoretical investigation that it has led to no insight worth mentioning concerning the actual historical process of growth in capitalist economies;² and in the planned economies, to which its authors pretended that the argument was relevant, it has been found to be of no use.³ As a reaction to this development and to the current world economic crisis associated with energy and raw material supplies, there is now a renewed concern about supposed "limits to growth" arising from the coexistence of exhaustible natural resources and rapid population growth.⁴ It is as if the wheel had turned full circle, back to the gloomy prophecies of the Reverend Malthus.

It is interesting to speculate on the causes of this abrupt turnabout. Certainly there seems to be a great paradox, even irony, in the turn from theories of steady and unlimited growth to models of "doomsday" projected to come from exhaustion of natural resources. This turn may have to do with the fact that economists tend to be myopic creatures of their own time, extrapolating endless growth during the boom phase of a long cycle and seeing impending doom when the downturn

comes. But there must be more to it than that. In particular, it must be taken to point to a certain distinct limitation of vision, inherent in a theoretical system which by its own logic either denies or fails to account for the self-sustaining, yet contradictory, character of the capitalist expansion process, except as the arbitrary outcome of fortuitous shocks and external forces.

Into this lacuna now steps Professor Pasinetti who, in the [1981] book reviewed here, returns to the Classical theme, delves into the deepest layers of the Ricardian theoretical tradition, and emerges with a remarkable tour de force. This work is conceived as a "theoretical investigation into the long-term evolution of industrial economic systems" (p. xi). Its subtitle ("A theoretical essay on the dynamics of the wealth of nations") is a giveaway of its consciously-felt Classical heritage and subject matter. It was motivated by the author's dissatisfaction with what he saw as the inability of contemporary forms of theory to explain certain observed historical phenomena: in particular, the continuing dynamism of technical progress in industrial economies and the accompanying patterns of uneven and non-proportional growth among different sectors. In a determination to look for new tools of analysis to account for such phenomena, he returns to a method of analysis which he locates in Ricardo. On the basis of this method, he sets out to build a unifying theory behind all the new contributions to economics which he sees as coming from Smith, Ricardo, Malthus and Marx, through Keynes, Kalecki, Leontief, and Sraffa, while explicitly rejecting the method and analysis of neoclassical theory. It is clear

that his goal is constructive and the task he sets himself is large and ambitious. The result, he indicates, is a complete theoretical scheme which he calls "the theoretical scheme of a natural economic system."

The work as a whole has been simmering for some time. It started out with his Ph.D. dissertation published in Pasinetti [1965]. Along the way there were many offshoots: digressions into capital theory controversies, elaboration of new theorems on steady growth, a reformulation of Ricardian growth theory, and two major volumes on the linear model of production.⁵ But one can see in all these efforts a steady line of advance towards this latest product which may well be regarded as a culminating point, though surely not a terminal point.

It is impossible to describe here, in the space of a few pages, all that is accomplished in this work and the texture of the underlying argument in all its rich details. It is possible only to try to indicate the highlights, to raise some questions about the argument, and to place the work in the context of the broad stream of related ideas in this area.

A Model of Production, Employment, and Growth

The general approach to economic reality and the set of premises on which the work is built are clearly and forcefully stated. It is an approach that focusses on reproducible commodities as the basic unit of analysis. In so doing, it abstracts, as the essential feature of a modern industrial system, the unlimited potential of productive activity taking place within a ^{social} ~~collective~~ division of labor that is capable of

producing all the requirements of consumption and production.

Associated with such productive activity, Pasinetti argues, is a process of "learning" by the human agents who set it in motion. It is this learning process which represents "the spring moving the whole system", because of the constant improvement in production methods that it entails and the associated changes in the pattern of consumer needs satisfied by the produced commodities. All problems connected with the existence of "scarce" or non-reproducible goods are thereby eliminated, those problems being regarded as having only a temporary and transient significance. It becomes possible, then, to focus analysis on what are considered to be fundamental determinants of the movement of the economic system. This approach, called a "pure production model",⁶ is sharply contrasted and opposed to that of the neoclassical Marginalist scheme of analysis of production and exchange based on scarce factors allocated in accordance with given preferences of utility maximizing individuals.

Given this approach, it is understandable that the author should seek to set his analysis firmly within the context of what has been variously called the activity analysis or input-output model, or the linear model of production. It is a model of production which seems compatible with his general purposes, and it has a long and respectable ancestry. In general, the formal properties of this class of model have been closely studied and made familiar in a vast literature. In fact, some of the most salient and interesting of these properties have been synthesized and systematized by Pasinetti himself (and associates) in

two recent books [Pasinetti, 1977, 1980]. Insofar as these formal properties are matters of pure logic, conforming in many instances, though not in all, to strictly mathematical theorems and proofs, there can be no cause for disagreement at this level. Differences do arise, of course, in terms of the particular specification given to the basic model, as regards, for instance, the number and types of commodities or sectors distinguished, the number of processes for producing them, the existence of circulating or fixed capital, single product industries or joint production, and so forth. Some specifications may be considered to be more or less useful for some theoretical purposes or simply a matter of analytical convenience. Some may be considered to be more empirically relevant than others. Some may give rise to sharply different analytical implications and results than others. But the most profound differences are those which arise from the theoretical practices, purposes, and uses to which the model is put, as indicated in the behavioral relations that are made implicitly or explicitly to underlie the model, in the economic interpretations associated with it, and in the kinds of theoretical questions that are addressed.

It is noteworthy, in this connection, that modern neoclassical theorists have not been averse to developing their theory in the context of this class of model.⁷ It would therefore be a misplaced criticism to charge them with being wholly preoccupied with the economics of scarce resources. What they have rather sought to do is to fit the model to the purposes of their own theory and, hence, to develop in this context the full meaning and significance of the fundamental neoclassical

approach of rational choice, market clearing prices, and competitive equilibrium. Regardless of one's evaluation of the results that have been achieved thereby, it must be granted that they have been remarkably adept at appropriating to their own purposes the formal apparatus of this model in the form originally presented by Leontief [1941, 1953] and von Neumann [1945]. By the same token, what is of special interest in considering the work presented in this book is to examine the specific theoretical project for which the model is adapted and the results that are achieved.

In the usual case of a linear production model, one is given the full tableau of input requirements for producing the various outputs, industry by industry (or activity by activity), where the inputs are themselves produced within the same set of industries. On the output side, the problem is to find that allocation of gross output among the industries which meets some given volume and composition of final demand as well as all the inter-industrial requirements for producing that same composition of output, subject to the limits of existing productive capacity and available methods of production. In the dynamic, as distinct from static, version of the model one takes explicit account of the capital stocks used in production and the corresponding replacement and investment demand associated with growth of the economy and studies the properties of the growth path. The other side of this problem is to find the set of prices which ensures that all costs are covered when inputs are evaluated at those same prices. For solving this problem, it could as well be treated as a problem in linear programming or in game

theory, which is the usual neoclassical approach. But Pasinetti eschews the use of such techniques, presumably because of their underlying presumption of optimizing behavior based on principles of rational choice. Moreover, it would beg questions of what objective is being maximized, and by whom, hence what institutional context is presumed, and this would go against his express purpose of conducting an analysis independent of institutional context. In any case, since in his initial formulation of the (static) problem there is only one production technique available and all consumption is assumed to be internal to the system, there can be no optimising in the usual sense.⁸ There is only a problem of full utilization of existing productive capacity and full employment of the available labor force. This aspect of the problem is of central concern in Pasinetti's analysis.

The formal solution of this set of problems is well known and has been presented in a number of different ways in the literature. The solution yields a definite composition of output and pattern of employment dependent on the coefficients of production and demand at the given growth rate of the economy. The solution of the price system is the "dual" of the quantity system, being uniquely dependent on the same production coefficients and on the prevailing rate of profit. In general, in order for a non-trivial solution to exist, a special condition must be satisfied by the matrix of coefficients. Specifically, the condition is that any industry or sub-group of industries must be capable of producing, in terms of own output, just enough to meet its own requirements for production and the requirements

of all other industries in the economy. If this is so for one industry it must be so for all, given the necessary interdependence, direct or indirect, among all of them. It is therefore a condition that must be fulfilled by the whole economic system, viewed as a system of interdependent productive activities. Or, as Pasinetti indicates, it is a fully macroeconomic condition independent of the degree of disaggregation of the productive activities. This seemingly simple algebraic condition is one that may be seen to have great economic significance. It was first presented and discussed in a remarkable paper by Hawkins [1948] with subsequent corrections by Hawkins and Simon [1949]. Hence, it has come to be known as the "Hawkins-Simon condition".

It is worth recalling here some other related features of Hawkins' findings,⁹ because it enables us to place in context some of the remarkable results of Pasinetti's analysis. In particular, Hawkins showed that, for an expanding system, there is at most one economically meaningful solution consistent with a steady state of balanced or proportional growth. All other solutions represent transient states superimposed upon the steady state, which are such that if any one of them grows at a rate greater than the steady-state growth rate there is a necessary tendency to continued disproportionate production leading to "breakdown" of the assumed condition of full employment - he called it "a crisis of disproportionate development" (p. 318). The economy is then inherently "unstable". This potential instability is shown to result from lack of a sufficient degree of linkage or "coupling" between

the different branches of the economy in terms of the input requirements of each branch from its own output relative to the requirements of all other branches. Again, the condition that is required, for "dynamic stability" in this case, is a restriction on the coefficients of the whole system. Hawkins drew from these results the striking conclusion, worth repeating, that: "In any exchange economy there are potential sources of instability that lie deeper than the imperfections of the exchange mechanism. These are characteristic of any dynamical system that consists of subordinate systems coupled by their own influences on each other" (p. 309).

Hawkins showed, furthermore, that the particular quantitative conditions for existence of an equilibrium solution and its stability are difficult to calculate in the complex case of complete interdependence among many sectors, but since any system may be reduced by a process of aggregation to a smaller number of aggregate departments, it is possible to arrive at simpler and qualitatively more meaningful solutions by such aggregation. It follows that the instability property may be represented equally well in simple two or three department models. It remains evident, at all levels of aggregation greater than or equal to two departments, that the instability property is associated with the degree of "coupling" between different branches of the economy.

These results have, by now, become fully absorbed and elaborated in the theoretical literature.¹⁰ Viewed in analytical terms, though not in actual historical context, they may be regarded as the point from

which much of the post-war discussions on economic growth took off, and in many different directions.¹¹ In particular, the instability property may be regarded as a direct representation, in an input-output framework, of what has become known as "Harrod's knife-edge".¹² Moreover, one might interpret the analytic content of the subsequent proliferation of neoclassical growth models as a (largely unsuccessful) attempt to show how it is possible to eliminate this property by assuming "enough" technical substitution and price flexibility in the economic system.¹³ The large literature on accelerator-multiplier models of the business cycle may be considered another branch of inquiry emanating from this point. At the same time, it is possible to see a close analogy between the form and results of Hawkins' analysis and Marx's earlier analysis of the requirements for simple and expanded reproduction, provided that one makes the appropriate conceptual modifications.¹⁴

This is also the point at which, one might say, recent analytical work in economic growth theory got stuck.¹⁵ And, interestingly enough, it may be considered, in a meaningful sense, as the point from which Pasinetti's analysis takes off, though within a distinct and unusual theoretical problematic.¹⁶

New Results in a New Framework

The author lays the ground for this take-off by, first, transforming the usual input-output scheme into a model of vertically integrated sectors. The analytical operation involved in doing this has

been elegantly displayed elsewhere [Pasinetti, 1973, 1980], and he employs the results of it here with great effect. The significance of the proof that this operation, often taken for granted, has an analytical basis under general conditions of production (including joint production) can scarcely be exaggerated and represents a fine achievement in itself. Its relevance to everyday economic usage, in both theoretical and empirical work, should be obvious. It is a powerful method of aggregation which provides one solution to the well known aggregation problem (hinted at by Hawkins) in dealing with complex input-output systems. In the present context, its significance is that, once the operation of forming vertically integrated sectors has been performed, it becomes meaningful to discuss the general theoretical problem without any reference to intermediate uses of the commodities and without any loss of generality in so doing. The connection to the intermediate structure of the economy can be found immediately by using what should now be appropriately identified as the "Pasinetti H-matrix". It also simplifies considerably the calculation of important quantities (of course, only because the calculations have mostly been done already, in the background, so to speak, by high speed computers with an enormous capacity!). Furthermore, and what is most important for Pasinetti's analysis, it becomes possible to express the relevant structural relations and equilibrium conditions of the economy directly in terms of physical quantities of labor. He derives them, step by step, through the elaboration of a sequence of increasingly complex models, arriving finally at a complete theoretical scheme in which all

of the complex details are fully exhibited.

Of particular interest is the fact that the Hawkins-Simon condition now translates neatly into an equilibrium condition for the allocation of labor in the economy. Clearly, if any productive sector (and all) must be just capable of meeting the needs of itself and others, then the same must be true of the "household sector" supplying labor services, when that sector is viewed as fully incorporated into productive activity (except that it is assumed here that labor is not directly consumed by the household sector).¹⁷ Pasinetti reverses this condition to say: as much labor must be demanded by all of the other sectors taken together as is available for employment from the household sector. This becomes, then, the static "full employment condition". It is supplemented by two other key conditions. One is a set of sectoral conditions, providing for full utilization of the available capital stock in each sector. The other is the "capital accumulation condition" for keeping full employment over time. This latter requires investment to be allocated to the different sectors of the economy in accordance with the exogenously determined rate at which capacity grows in each. These three conditions constitute the full set of equilibrium conditions on the output side, or the "effective demand conditions", and they are central to the whole analysis.

In the usual context of steady-state growth models, with or without technical change as usually defined, if these conditions once held they would continue to hold forever, as long as no outside disturbance or shock occurred to displace the economy from the steady

state path. Of course, even in that context, there may be no possibility of these conditions continuing to hold. For the reasons that Hawkins showed, the economic system may be inherently unstable. But in Pasinetti's scheme there is never a possibility of any set of equilibrium conditions continuing to hold beyond a single period. This is because of the key role that uneven technical change and the evolution of consumption patterns play in the movement of the economic system. These forces operate always and systematically to disturb and alter the conditions that already exist. Thus, every possible equilibrium is about to be upset by those forces. Therefore, instead of the conditions of equilibrium being given once and for all, they are different in every new period. Furthermore, and this is the main point, the specific combination of these forces is such that it may be impossible in general to maintain equilibrium through time. Consequently, there is an ever-present tendency towards unemployment owing to the "structural dynamics" of the economy.

The deeply analytical point which, I would suggest, is (proximately) responsible for this striking result may be seen from our earlier discussion. Specifically, one sees that, in a "static" economy (i.e. one without change in the coefficients of production and with or without net expansion, as in Hawkins' model), there is a certain necessary "coupling" of the different sectors which ensures the capacity of the economy for self-reproduction without crises. Without that coupling, the economy is inherently unstable or, one might say, crisis prone. Now, if one could go on to show that, as the system develops,

there are dynamic forces which are always at work systematically to "uncouple" or tear apart the relations between sectors, one could conclude then that the economy is, so to speak, permanently crisis prone. This is the full force of Pasinetti's reasoning, and it is a powerful argument which yields a most interesting result.¹⁸ It gives rise to a theory of crisis due to the continuing process of uneven development of the economic system and it associates the crisis with a persistent tendency to unemployment.

So far as the relation of this analysis to earlier work is concerned, the important and crucial difference is in what is meant by "dynamics". Compare, for instance, the highly restrictive meaning of "dynamic analysis" in Leontief [1953, ch. 3]. Pasinetti's idea of "structural dynamics" refers to the existence of regularly recurring and persistent change in the quantitative proportions of the economy and the non-uniformity of growth rates associated therewith. This is a broader conception and must be seen as a considerable advance. With this conception, it becomes possible for the author to show that, in general, no equilibrium is capable of being sustained because there are powerful forces constantly at work to disturb any such equilibrium. Here is the real power of the argument. But, paradoxically, it is still the case that both types of analysis are essentially fixed on equilibrium. Pasinetti's "structural dynamics" is constrained within the requirements of his special conditions of equilibrium, albeit a moving equilibrium, and, oddly enough, equilibrium is itself conceived as a kind of "natural" state. Here one runs up against a ^{highly} problematical feature of

this analysis that needs to be pursued further (see below). The specific conception of structural change presented in this work must itself be seen as a limited one, insofar as it does not take into account the quantitative and qualitative changes or discontinuities involved in various theories of "stages" of development, such as contemporary theories of a transition from competitive or "early" capitalism to "monopoly" or other forms of "late" capitalism (cf. Steindl [1952], Mandel [1975], Kaldor [1960]). Evidently, the author is precluded from considering such "institutional" changes by his own frame of reference which explicitly rules out of court any specific institutional context.

The Structural Dynamics of Uneven Growth

The above-mentioned result of this model comes basically from the explicit introduction of changes in the coefficients of production and demand into what were before inherently "static" models of the growth process insofar as they abstracted from or ignored such changes. Pasinetti correctly insists on the necessity to take account of such changes and, hence, on the importance of analyzing what he calls the "structural dynamics" of a growing economy.¹⁹ As he recognizes, it is not that previous theorizing had failed altogether to incorporate some idea of technical change. It is rather that, in the recent forms of growth theory, technical change was introduced into the scheme of analysis in such a way as to make it compatible with the basic conception of an economy in which there was no change in "structure",

characterised in terms of the quantitative relations between input and output, between the output, employment, and productive capacity of different sectors, and the pattern of relative prices and incomes. In order to be consistent with this conception, technical change had to be treated as taking place at a uniform rate in all sectors and demand had to be made to grow at a uniform rate for all products. The author argues forcefully and convincingly that this is a special and highly restrictive case. He seeks, therefore, to offer a more general conception that is more in keeping with the actual observed historical record of uneven growth in industrial economies.²⁰

The essential feature of this conception is the presumption that technical change occurs unevenly among sectors so that the rate of change of labor productivity differs from one sector to another. Correspondingly, demand changes at a different rate among different commodities. Moreover, technical change may take the form of introduction of new products and new processes for producing them. In no meaningful sense, then, can the matrix of coefficients characterising the economy be taken as given, except as a matter of the situation prevailing in a short term context. It is this conception that motivates the analysis presented in this book. For the purpose of dealing with some of the complexities that it involves, the author constructs an elegant formal model and puts it through its paces, spelling out in detail its manifold implications.²¹

The unique features of the model relate to the condition that changes in the coefficients of production and demand take place at a

non-uniform rate as between different sectors. These changes, though assumed to take a definite form, are mostly taken as given from outside the model. Specifically, productivity (of direct labor) grows at a given constant rate in each sector. Population also grows at a given rate, but flexibility in the labor supplied by a given population is allowed through variations (considered of a short term nature) in working hours and in participation rates. Similarly, on the side of productive equipment, variation in utilization through shift work is allowed. Replacement is proportional to capacity and independent of the rate of use of equipment.²² For the above reasons, the natural rate of growth in Harrod's sense, though still given exogenously, is considered a variable depending on the movement through time of these parameters and the pattern of sectoral growth.

Demand coefficients (defined as per capita demand) change in a complex way that is endogenously linked with changes in the production coefficients. This is, in some ways, the most striking and radically new departure in this model. It may be pointed out here that there is nothing in the assumptions usually made about technology in other models of the multi-sectoral linear-production type that should in principle limit the analysis to consideration of the singular case of proportional growth, except for the presumption (explicit or implicit) of unitary income elasticities of demand. Therefore, even in the absence of technical change of the type considered by Pasinetti, what was necessary in order to admit the possibility of non-proportional growth was to give up this highly restrictive condition on the demand side.²³ Pasinetti

cuts both knots simultaneously and then proceeds to connect the pattern of demand changes in a specific way to the changing level of productivity. The result is to provide a potentially fruitful analytical link between demand and production that has heretofore been ignored.

This innovation is based on a subtle hypothesis regarding the evolution of consumers' demand over time, which implies the eventual attainment of saturation levels for every class of consumption good. The specific meaning of this hypothesis in the context of the model is that, though demand coefficients for all classes of commodities change over time, they do so in a discontinuous way, so that there is a necessary tendency for the rate of growth of consumer demand to fall off relative to the growth of per capita income and productivity. It is this feature of the model which, in combination with the rest, gives rise to the result of a persistent tendency towards unemployment. In particular, since all the production coefficients are decreasing over time, full employment can be maintained only if the demand coefficients increase in the same proportion. But demand tends to stagnate, so that inevitably the effective demand condition for maintaining full employment becomes under-satisfied, resulting in unemployment.

Two sets of counteracting tendencies are identified which may serve, for a time, to counterbalance this effect. One is the introduction of new commodities, which gives a boost to employment by adding new sectors to the production system. But this is a possibility which is not automatic. In any case, since presumably other commodities

may be simultaneously falling out of the system, the overall effect may be ambiguous. Another possible counteracting effect, associated with decreasing work time and participation rates, is also not automatic. Consequently, the basic tendency is considered likely to remain dominant, in the absence of tight coordination by a "central Agency". For this tendency to be the dominant one, it must of course be assumed that all technical change is ultimately of a labor-saving kind. This is the assumption that is explicitly made and it is evidently a strong one. But if that is in fact the case, then it is not evident that even the central Agency could do much to forestall or avoid the effects that such changes produce, unless it can hold back the onward march of technology.

Changes in production and demand of the type identified produce other employment effects in this model which come into play even in the absence of generalised unemployment. In general, the whole production structure is changing over time as some sectors, for a time, expand relatively to others and others contract. Continual readjustment of the labor force is therefore required, involving relocation from some sectors into others, which may be only partly mitigated by the effects of new entry of younger workers and retirement of older workers.

The structure of relative prices changes over time in a manner consistent with underlying changes in costs of production associated with the structural changes that are going on. It is supposed that, if there are "institutional" obstacles to cutting prices in the sectors which require price cuts, there is a consequent tendency to creeping

inflation. Though the overall profit rate remains around a constant level, averaging out the ups and downs, profit rates in individual sectors undergo sharp changes in accordance with changes in demand and costs, so that the structure of profit rates is itself highly variable. On their part, the individual producing units, which are seen as reacting to these changes taking place around them, must adjust their production and investment decisions to accommodate them and this may give rise to investment "pauses" and "starts", taking the form of alternating phases of boom and bust at the level of the system as a whole.

These, and more, are the many interesting and complex effects which are shown to follow from the basic forces operating to bring about structural change in the economic system over time. In general terms, it is a theory of what might be called "structural" or "technological" unemployment considered as an inherent feature of the process of expansion and development of the economy. It is a distance removed from the usual Keynesian explanation of unemployment and must be seen, therefore, as a distinct theory. It would no doubt be possible to derive something like the Keynesian argument in this context, but it would become then an essentially short term argument. Instead, the full import of Pasinetti's analysis is to suggest that "the very nature of the process of long-run growth requires a structural dynamics which leads to difficulties in the short run" (p. 243). As such, it falls within the general class of theories of secular stagnation due to "underconsumption", though within this class it stands by itself because of its own special and unique features. The idea of persistent

unemployment, taking the form of a "reserve army" of labor, as a definite and necessary product (a "general law") of the capitalist accumulation process was, of course, first developed by Marx (Capital, vol. 1, ch. 25) on a rather different basis. In his brief chapter "On Machinery" in the Principles, Ricardo foresaw the possibility of technical change having the consequence of creating unemployment, but he did not develop this insight into a systematic theory.

The Moving Forces and Mechanisms of Change

There can be no doubt that this analysis, considered in terms of its "predictions", presents a reasonably accurate and "true" description of some of the actual observable features of industrial growth over the past two centuries or so. The "stylized facts", if we may call them that, indicate a picture of recurrent periods of substantial unemployment, large scale relocations of labor between different sectors of production, not only between agriculture and industry and within the industrial sector broadly defined but also as a process of international migration of labor (and capital) on a world scale. The picture includes dramatic transformations in the composition of output, in productivity, and in techniques of production. A pattern of recurrence of periodic booms and slumps, intensified in the twentieth century, is also clearly apparent. The picture derived from Pasinetti's analysis conforms closely to these facts.²⁴ Moreover, this analysis comes up with some useful and innovative proposals for dealing with the complex statistical and conceptual problems involved in constructing meaningful index

numbers of such aggregates as real wages, total output, and capital stock, to represent these facts. The analysis also captures some of the necessary ingredients of the story that must be told in seeking to account for these facts. The question that may be raised is whether it has succeeded in giving us a firm handle on the deeper causes and underlying forces and the mechanisms through which they operate. From the standpoint of a theory of structural change and growth, the crucially relevant questions are: What are these forces? From whence do they come? And how do they work themselves out in the context of specific social relations of production and exchange?

The "fundamental forces" in this analysis are uniquely identified as the combined forces of population growth, technical change, and consumers' preferences. They are taken as data, not in the sense that there is no change in them - in fact, it is their quantitative change that is of special interest in this analysis - but the rate of change is given. This is so for population and technology and, though the rate of change of consumers' demand varies with the level of productivity, it is still the case that consumers' preferences are given. The author suggests that these forces are given "outside of economic analysis" and it is not evident what is meant by this. But, in any case, they must be given independently of the quantities and structural relations in the economy in order that they can be considered to determine those quantities and relations and the economic outcomes described above.

It may be noted here that, insofar as these forces are merely taken as given, in the sense defined, there is no necessary

incompatibility between this analysis and the typical presumptions of neoclassical theory. Considered at its most fundamental level, that theory does not require for its internal logical consistency that production functions, consumer tastes and work-leisure preferences of the population are fixed and unchanging. It requires only that, if they change, they do so in a definite and predictable way so that they can be taken as "stable" and, hence, for purposes of theoretical construction, as given and independent. Thus, in a world in which there occurred the particular changes that Pasinetti takes as data uniquely determining the movements of the economic system, the sophisticated neoclassical theorist would find no cause for discomfort and would have a lot of room to play. What would be (to the neoclassical theorist) a far more drastic and discomfoting departure would be to show that such "data" are generated by a process which is internal or endogenous to the workings of the economy and which, though capable of being described in general terms as being, for instance, stochastic and adaptive, and having regularities suggesting that it is law governed, hence capable of scientific investigation, is nevertheless far from being "stable" and "predictable" so as to make irrelevant the usual neoclassical conceptions of "well-behavedness" of technology and preferences, optimizing behavior, and equilibrium tendencies.

The author does not engage directly these higher level considerations and he does not offer an explicit account to support one view or the other. It is not his purpose, as he says, to offer a theory of population dynamics, of technical change, and of consumers'

preferences. However, these considerations are more or less in the background and he points in their direction. Specifically, this is the significance that must be given to his emphasis on the idea of a "learning process" as a factor accounting for changes in technology and consumers' preferences. In making this emphasis, he is undoubtedly on solid empirical ground, as is suggested by a growing body of research on production and consumer behavior. He is also, at the same time, suggesting a potentially challenging alternative to neoclassical theory. For one thing, this idea of a learning process makes untenable the neoclassical construction of consumer preferences as being defined once and for all over the entire space of available commodities. It suggests, instead, that formation of consumers' preferences is more a local phenomenon, operating through a kind of limited "search" in the immediate neighborhood of experienced consumption. Similarly, on the production side, it makes untenable the typical neoclassical construction of production functions as defined over all available methods and shifting totally as a consequence of technical change. Rather, in the context of a properly specified learning process, technical change must be considered, as is the case with change in consumption patterns, a local phenomenon, operating within the experience of previously known methods and at the level of particular production activities and sub-processes. Furthermore, this idea points to the existence of types of irreversibility in economic and social life which make meaningless the essentially neoclassical construction of economic activity as rational behavior involving optimization over the

whole range of known alternatives. On the other side, it is the existence of such irreversibilities which ultimately gives meaning to the insistent distinction that Robinson [1962] makes between "historical" and "logical" time. Finally, one kind of irreversibility, consistent with this idea, is the one that Marx saw in capitalist social institutions which, being the outcome of previous and ongoing social development, constantly runs into conflict with the requirements of the present and must therefore undergo change, giving rise to further social development.

Thus, the idea of a learning process has powerful implications for theoretical and historical analysis. It has accordingly been seized upon by a number of forward-looking contemporary scholars.²⁵ Pasinetti makes good use of this idea on the consumption side of his model. But he does not exploit the full potential on the production side, insofar as he assumes that technical change is a smoothly recurring process taking place at a constant (but non-uniform) rate in all sectors. It is important to emphasize that this general idea makes it both possible and necessary to conceive the process of development of technology as being inherently uneven, not only in terms of differences in the rate of change across sectors and commodities but also in terms of the "bunching" of changes as they occur in historical time. Moreover, it is the associated idea of the localized character of technical change which gives meaning to the specification of production in terms of a detailed input-output scheme and makes that scheme, therefore, so compatible with a "pure production model". If this last point is granted, then it would

make ambiguous the analytical advantage that the author claims for his scheme of vertically integrated sectors, since the effect of the aggregation that such a scheme entails is to wash out completely the local character of technical change. In this respect, it has some of the very same disadvantages that he so clearly identifies for the usual aggregative measures of technical change.

The analysis ignores the role of natural resources. This approach seems reasonable as a first step, because it properly assigns conceptual priority to reproduction^{ible} commodities. But it would seem necessary to grant, even at this level, as long as technical progress is the main focus of analysis, that the rate and direction of such technical progress may be significantly conditioned by the economic stimulus that comes from the dynamics of natural-resource utilization. Consumption patterns may also be similarly influenced. In general, access to and use of specific natural resources or raw materials may modify the path that a particular economy follows, and, insofar as there are irreversibilities associate^d with experience, make it difficult for other economies to catch up or for that economy to adapt to new ways. These are significant aspects of the process of uneven development and disproportionality of growth that are not captured in this analysis.²⁶

A larger question concerns what it is that moves the "fundamental forces" including the learning process itself. The author does not give us much of a clue to the answer, except to say that it is abstract Man and not Nature (p. 23). This does not take us very far.²⁷ It also lays him open to the charge, which Marx effectively levelled against the Classical economists, of seeking to universalize the historically

specific conditions of capitalist production. The power of Marx's own reasoning was to show that these forces reside within capital itself, conceived as a system of circuits of individual units of capital, bound together by competition, with each and every one being driven to expand endlessly through subordinating all productive activity to its goal of expansion. Marx vividly portrayed the manifold ways in which capital, as the moving force, goes about systematically "transforming the productive powers of social labor as if in a hot-house."²⁸ There is no such conception to be found in Ricardo or, for that matter, in Adam Smith (despite the significance that Smith assigned to the division of labor). It seems, therefore, that if there is a source for the idea of a "pure production model" it is more likely to be found here than in Ricardo, or in Smith. As regards the specific problem of population growth, Marx did not have much to say. But he did argue that it was necessary to develop a theory specific to capitalist conditions. He also distinguished sharply between labor supply and population, recognizing that the former is largely independent of the latter and may have considerable elasticity depending on the conditions of capitalist accumulation itself.²⁹ On their side, the Classical economists adopted the Malthusian subsistence-theory of population which has, by now, been discredited and abandoned, but no theory has so far emerged to take its place. The problem of providing an adequate account of the evolution of consumption ^{patterns} has remained a difficulty for all forms of economic theory and, contrary to a popular presumption, certainly cannot be said to have been solved by neoclassical theory.

Equilibrium and the "Natural Economic System"

One of the most conspicuous features of the model presented in this work is that there are no actors in it. Activities of consumption, production, and investment are all taking place, but we are told nothing about the actors who undertake them. There are prices and rules for the formation of prices, but no specification of the actors who implement these rules, the reasons why, and what would happen if prices were set at a level different from what the rules require. We are told only that all prices perform "the same role of providing appropriate indexes for efficient decentralised decisions" (p. 134). In effect, prices play an entirely passive role in the model, mirroring and adjusting to the changes taking place in production. There are also wages and profits, as categories of income and as "factor prices" (the two categories are sharply distinguished, pp. 133-36), but no indication of who gets the corresponding incomes and what is done with them. The incomes are not connected in any essential way with the activities of investment and consumption. There is a real wage rate, measured in terms of purchasing power over a basket of commodities, and a careful effort is made to define this difficult concept in the context of technical change with new commodities, but no indication of how much wage earners actually spend on those commodities and what determines the composition of the chosen basket. Profits are measured as a rate, in proportion to total capital, and the rate of profit may differ between sectors, but no indication is given of how and why this difference could persist if the owners of the capital actively seek out profits for their own ends.

Technical change is occurring all the time, throughout the whole economic system, but this has nothing to do with the activity of the investors or with the rate of their investment. The investors simply do what is necessary to maintain the natural growth rate. It is supposed that drastic transformations and adjustments in economic and social conditions are taking place. A detailed and vivid description is presented (see ch. 10) of the specific form of these transformations, the many grave problems that they impose on the participants, and the decisions that they must take in order to deal with those problems. But no analysis is made of how these transformations arise out of the actual decisions of the participants themselves. All in all, we cannot really say, then, why any of the results so elegantly displayed by the model should happen, what actions of the participants bring them about, and how the participants react to them.

The fact is that everything which happens in this model is an aspect of the general requirement of full-employment equilibrium. The equilibrium conditions are the centrepiece and the main point of the story. But what "institutional mechanisms", if any, are capable of bringing about such equilibrium? And what happens when the economic system is not in equilibrium? The author does not give us the benefit of his reflections on these questions. He emphasizes that it is not his purpose to deal with specific institutional mechanisms. Yet it is presumed that the analysis is applicable to real functioning capitalist economies. So, the questions cannot really be avoided. He gets around the problem by construction of an intriguing device called a "natural

economic system."

It is evident that this is the piece de resistance of the work and it must be admitted that it is an ingenious construction. Space does not permit going into all of its intricacies. But as it turns out, putting all the flourishes aside, the natural economic system is essentially a golden-age equilibrium of a very special kind. It is one in which all of the structural changes which the author believes it is important to analyze unfold in full view as time goes by. These are the changes which, if we are to accept the stylized facts, do happen in real life and sometimes with disastrous consequences. But in the Pasinetti-golden-age they happen without any disturbance, specifically in regards to the condition of full employment. Whereas in the ordinary golden age nothing happens, at least as far as changes in "structure" are concerned, in this particular golden age all sorts of changes occur and still there is full employment. We could just as well call it, therefore, a super-golden-age.

The author shows that, as long as attention is focussed only upon the super-golden-age, a host of deep theoretical problems can be immediately resolved. One by one, the index number problem, interest and profit rate determination, choice of technique, classification of forms of technical progress, the so-called Leontief Paradox and other problems in international trade theory, all fall into place. The well known Pasinetti Theorem on growth and profits appears here too in a new light.

But the most impressive achievement is the demonstration that,

even at a positive rate of profit and with different capital intensities among industries, prices can still be reduced entirely to embodied labor. This is done via the construction of what is called a "vertically hyper-integrated labor coefficient" and, for this, the scheme of vertically integrated sectors comes in handy (in fact, it is indispensable). The analysis is brought to a point of full closure with the derivation of a "dynamic standard commodity", or the complete "invariable standard of value". It is here more than anywhere else that the Ricardian influence can be seen in this work.³⁰ Though Ricardo is turned on his head in some other respects, he is fully vindicated in this result. In particular, it is now shown that it is logically possible to have a 100 percent labor-value theory of price. Ricardo in his own day had failed to show this, and many others have tried, but we now have for the first time a fairly general proof. Marx, for his part, criticized Ricardo for holding to such a rigid formula of price determination and took a rather different route, the logic of which has also been the subject of much recent discussion and analysis.

The question remains: what, if any, is the interpretative value of the natural economic system, or super-golden-age, for any actually functioning economic system? The author does not really say. He makes a sharp separation between two levels of analysis: one dealing with the super-golden-age as a matter of purely logical relations, the other dealing with real world problems of institutional mechanisms (pp. 153-155). By choice, he confines his attention to the former.³¹ He acknowledges that the logical relations are impossible to attain. Yet,

he offers the strange suggestion that it may be desirable for any economic system, whether capitalist or socialist, to arrange its affairs so as to move towards the natural economic system. This can only leave one perplexed.³² It would be better to have simply recognized the constructive and powerful analytical role that the equilibrium conditions play as a reference point for deriving the positive insights earlier discussed concerning the inherently disequilibrating tendencies associated with "structural dynamics".³³

Conclusion

This work is one of the most impressive products to date to have come out of the so-called Anglo-Italian school.³⁴ It is, also, perhaps the finest achievement in the Ricardian tradition since Sraffa's edition of Ricardo's Works and Sraffa's [1960] treatise. The landmarks and the groundwork had already been laid along the way by Sraffa. But this book represents the fullest development of the logic of one line of reasoning within that tradition. At the same time, by being so explicit and thorough in elaborating this particular position, it enables us to see more clearly the distinct route that Marx took, away from Ricardo.

Within the field of economic growth theory, the analysis of "structural dynamics" of a growing economy presented in this work is a considerable advance. It shows how it is possible analytically to integrate technical change and evolution of consumption patterns as real determinants of the movement of the economy, though these forces are not themselves determined. It leaves open the important question of how to

deal with disproportionalities arising from use of natural resources, as an integral part of the same structural dynamics; but this could be seen as a next step.

The interpretative value of the natural economic system for any actually existing capitalist economy remains very much in doubt. The same could be said of its value for any planned socialist economy. But whatever may be the (Ricardian) uses of this construction, it still leaves us with the questions posed in the last section concerning the concept of equilibrium that it entails. To pose these questions is, in fact, to open up a hornet's nest in relation to the entire post-war tradition of economic growth theory, to say nothing of economic theory in general.³⁵ Within the framework of neoclassical theory, the issue appears in the form of the question of "stability" of equilibrium. Even in this highly restrictive form, however, the issue cannot be said to have been resolved.³⁶ It would be unfair to ask of Professor Pasinetti, given his own frame of reference, that he should have provided a solution to this difficult problem. There is also no use in pretending there is an easy solution, or that the correct solution is at hand.³⁷ Those who have actually done the work deeply enough to understand what is involved know how hard it is to find a way out and still have something worthwhile to say. It could be argued, of course, that the problem is badly posed. But there is no possibility of finding a solution in "history", taken as a thing by and for itself, or in empirical data. What is at issue is essentially a problem of theory, that is, how to theorize the real processes of the capitalist economy.

For this, no purely imaginary construction will do, no amount of wishful thinking, and no amount of mere talk. The problem still remains to be resolved, and therefore economic theory still has a far way to go.

Footnotes

*Review of Pasinetti, L. Structural Change and Economic Growth, New York, Cambridge University Press, 1981.

¹For an exposition of this set of ideas, see Koopmans [1964].

²One would have thought it was obvious that under normal circumstances the capitalist economies are nowhere near their supposed von Neumann ray. But one group of researchers go so far as to suggest that, at least in one case, that of Japan, recent experience confirms the turnpike hypothesis. See Murakami, et al. [1970]. Perhaps we shall soon be able to observe in Japan the final splash of consumption that comes with the attainment of Ramseyan Bliss!

³For a discussion of the relevance of this idea with specific reference to the Hungarian economy, see Kornai [1972].

⁴The main ideas on this were presented in the report of Meadows, et al. [1972] which has spawned a large and continuing stream of work. A balanced and insightful view on the set of issues raised in this report and elsewhere is developed by Rosenberg [1976a, part 4].

⁵For the high points along the route, see Pasinetti [1974, 1977, 1980]. The latter two are English translations of earlier publications in Italian.

⁶To give priority in Ricardo's work to this idea of a pure production model requires suppressing the crucial role that the conditions of agricultural production, specifically the limited fertility of the soil, played in his theory of distribution and growth; or this latter element must be regarded as subsidiary and incidental to his main purpose. In any case, it seems clear that this idea is only latent in Ricardo's work and he failed in his own time to develop its full logical implications.

⁷See, for instance, the works of Dorfman, et al. [1958] and Koopmans [1951] both of which launched a major new effort of neoclassical theorizing.

⁸Or else it is simply assumed, for instance, that the problem of choice of technique is solved in the background, as when he says "at the beginning of the time period considered, the production processes are programmed in the best way that is technically known" (p. 29).

- ⁹The significance and originality of this paper ^{is} ~~is~~ often overlooked, because of an error in the proof and because of the treatment of prices which ignored profits on capital. More importantly, however, its unpalatable conclusions were swept away by the subsequent wave of neoclassical models which showed that rational choice under conditions of perfect foresight by utility maximising agents (sometimes conceived as a benevolent dictator) would be sufficient to eliminate the macroeconomic difficulties that Hawkins had identified. Solow [1959, p. 30] acknowledged the importance of this paper but treated it as "a bit of archaeological prehistory."
- ¹⁰For the main line of subsequent development, see Jorgenson [1960], Solow [1959], Morishima [1958].
- ¹¹Much of this literature, as it concerns in particular the analysis of "stability", suffers from its application to the economic system of an analogy with electrical and mechanical systems - a point already apparent in Hawkins' paper. The economy is typically conceived as a machine which operates by certain fixed rules and has a tendency either to maintain itself indefinitely in equilibrium or to break down from its own weight, depending on certain critical values of the parameters. There is no feedback, no learning, and of course no systematic state intervention. The results achieved therefore amount sometimes to a kind of crude technological determinism.
- ¹²In fact, Solow [1953-54] showed that, on his assumptions, Harrod's analysis could be regarded as a special case of the "Leontief system".
- ¹³This effort could be considered successful only as long as one confines attention to the highly restrictive case of a one-commodity model. On this, see Harris [1980]. But as soon as one moves to consider a case of production with a single distinct capital good and decentralized markets, the neoclassical stability result breaks down unless recourse is taken to special ad hoc assumptions. In the full context of a heterogeneous production system the untenability of the neoclassical result emerges with full force, except again through resort to the most artificial assumptions. This point is now conceded, as the outcome of work by Hahn [1960, 1966].
- ¹⁴This analogy was explicitly drawn by Hawkins [1948, p. 320, n. 6]. For a development of the exact connection of Marx's reproduction scheme with recent growth and capital theory, see Harris [1972, 1978].

- ¹⁵Standing outside of this immediate frame of reference and significant in their own way as attempts to provide a theoretical account of the process of capitalist expansion are the works of Kalecki [1971], Steindl [1952], Robinson [1956], and Kaldor [1960].
- ¹⁶It is possible to overstate the case for such continuity. Pasinetti himself gives a forceful critique (p. 18) of the common presumption that new theories are mere generalizations or extensions of existing ones. But his own analysis, as is shown below, has much in common with these earlier models. The very way in which he develops the case for his own model can be seen as a process of logical development, step by step, from simple to complex cases, where each is a development from the previous one and includes it as a special case. The procedure of going from simple to expanded reproduction in Marx could perhaps be seen as parallel to this.
- ¹⁷The author avoids the forced and misleading interpretation, common in the literature of "closed" input-output models, that the "household sector" is itself an industry, on a par with all others, producing labor as an output by drawing inputs from other sectors. In fact, the supply of labor is wholly outside of this model, though the quantity available grows at a specified rate. Since the requirements of consumption and investment are proportional to labor and labor employed is proportional to output, the demand coefficients and labor coefficients fit symmetrically into the coefficient matrix. It becomes then only a matter of interpretation, but the particular interpretation adopted can make a world of difference. It is not, therefore, just a formal problem.
- ¹⁸This is not quite the way that he himself expresses the meaning of his results and he might justly object to this representation of them. But it is certainly an implication of the logic of his argument.
- ¹⁹It is interesting to note that, whenever passage is made from the more abstract growth models to any direct empirical estimation of a multi-sectoral growth model, it has been found necessary to incorporate into the empirical model exactly the kinds of structural changes and nonproportional growth patterns that are of concern to Pasinetti. See, for instance, the Cambridge Growth Project [1962] and Johansen [1974]. This serves to confirm the empirical significance of the phenomena and the need for a systematic theoretical analysis of them.

- ²⁰P. Leon [1967] expresses a similar concern and offers a related view on this general problem.
- ²¹He criticizes the neoclassical Marginalists for being too much preoccupied with "rigour, not relevance" (p.16), but he is himself not averse to writing down the equations of his model. This is a trait to be admired, since it makes it possible to see clearly what is being said, to identify any logical errors, and to agree or disagree with the argument. It must be recognized, of course, that equations do not speak for themselves. But in Pasinetti's skillful hands they speak loud and clear. Here is a true master-craftsman.
- ²²Though severe, this condition is not a matter of principle and could be easily dropped. However, as it stands, it does cause the analysis of "structural dynamics" to miss some interesting and important features related to observed replacement cycles and "echo effects" associated with investment and technical change.
- ²³The "turnpike" model is, in a sense, a very special and artificial case of non-proportional growth driven by "demand" considerations associated with specific growth objectives. It has been extended to include non-linear consumption functions; see Tsukui [1972]. Unequal growth in consumption is also considered by Stone and Brown [1962].
- ²⁴A careful documentation of some of the relevant facts for many countries over long periods of time is presented by Kuznets [1966]. For a detailed study of a particular country, see Carter [1970].
- ²⁵Examples of its diverse uses in economic analysis are Arrow [1962], Kaldor [1972], David [1975], Rosenberg [1976a].
- ²⁶For a perceptive discussion of some of these issues, see Rosenberg [1976a].
- ²⁷Even at this abstract and general level, the statement begs the question whether it refers to Man in Nature (that is, man "in the natural state") or to man in specific social relationships to other men. The former route leads only back to Nature. The latter points to the necessity of investigating the social relationships in their specificity and uniqueness as they arise out of and impinge directly on man's activities.

²⁸As for instance when he writes: "Modern Industry never looks upon and treats the existing form of a process as final. The technical basis of that industry is therefore revolutionary, while all earlier modes of production were essentially conservative. By means of machinery, chemical processes and other methods, it is continually causing changes not only in the technical basis of production, but also in the functions of the laborer, and in the social combinations of the labor-process. At the same time, it thereby also revolutionises the division of labor within the society, and incessantly launches masses of capital and of workpeople from one branch of production to another" (Capital, Vol. 1, pp. 486-487). For an appreciation of the particular significance of some of Marx's ideas for analysis of the process of technical change, see Rosenberg [1974, 1976b]. In this connection, it is strange that Pasinetti writes of Marx's theory that " 'the material forces of society', which grow and eventually come into contradiction with the existing production relationships, are regarded as an effect of capital accumulation, but this process is not connected with improvements in technical knowledge in any essential way" (p. 21, n. 28).

²⁹See Capital, Vol. 1, ch. 25.

³⁰Despite the connection with Ricardo that is noted here, Pasinetti's characterization of the natural economic system as a state in which there are persistent differences in rates of profit among sectors of the economy seems not to correspond to the conception that is usually found in the Classical Economists (Ricardo included). The distinctive feature of the latter is commonly thought to be the condition of a uniform rate of profit as a necessary tendency associated with mobility of capital between different lines of production. On this, see, for instance, Garegnani [1976].

³¹In this regard, it is interesting to note the marked difference in approach between the work of the author under review and that of other leading authors of the "Cambridge School". For instance, Joan Robinson begins her major treatise on the same subject [1956, p. 69] with the unambiguous and bold assumption that "the capitalist rules of the game are well established and have long been played." Similarly, Kaldor [1960, p. 247] emphasizes that he is concerned with "the laws of evolution of capitalism".

- ³²One is inescapably drawn by the sheer logic of the argument as it unfolds to anticipate this conclusion, but it is perplexing nevertheless when it is finally stated. Since the point is not further pursued, one must infer that it was just a temporary flight of fancy. On the other hand, a similar suggestion had earlier appeared elsewhere and was repeated for emphasis (Pasinetti, 1974, pp. 116-17, 143-44). But there, it was meant only for capitalism and required only that the system should first rid itself of capitalist consumption with the object of moving to a socialist system. Here, some more complicated adjustments are required, and by both types of economic system, in order to attain (dare one say it?) the "Pasinetti 'bliss'-point".
- ³³For a further discussion of the analytical uses of an equilibrium (or reproduction) scheme along these lines, see Harris [1978].
- ³⁴It has the distinctive flavor and aroma of the rarest Italian wine, matured in the cellars of King's College, Cambridge, and brought out for the most festive, yet serious, occasion - perhaps to celebrate the beginning of the tercentenary of Classical Political Economy?
- ³⁵This was one of the chief aims of my own [1978] effort in this field. One may, of course, for certain limited purposes, as pointed out in that work, still want to hold on to a type of equilibrium notion while recognizing its strict limitations. It is important in this line of work, as in others, not to yield to becoming a Luddite, especially when the alternative means of production are nowhere in sight!
- ³⁶This point was conceded early on by Hicks [1965] who then, except for a brief foray into Austrian territory, threw in the towel and, like so many others before and after him, turned to "history" for the solution; see Hicks [1969].
- ³⁷A defence of the Classical method of long-period equilibrium in opposition to other equilibrium notions that have appeared in recent forms of neoclassical theory is presented by Garegnani [1976]. However, quite apart from any question of superiority of that method, there exists, to my knowledge, no systematic elaboration of the specific implications of that method for theoretical analysis in the context of the kinds of changes discussed here.

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