

Janvier 1975

THE TRANSITION FROM CLASSICAL
TO NEO-CLASSICAL ECONOMICS :
A CASE OF SCIENTIFIC REVOLUTION

par

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Working paper n° 7502

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This paper will be published in the Journal of
Economics Issues (September 1975 issue).

The author would like to thank Mr de Souza and
two anonymous referees for their helpful comments
on a previous draft.

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The success of Thomas Kuhn's work The structure of Scientific Revolutions in circles to which it was not initially addressed is particularly striking in the case of economics. In the last years, studies applying the Kuhnian framework to economic science have flourished, and no discussion about the history of economic theories takes place without at least a reference to Kuhn.¹ Undoubtedly, his ideas have provided the basis for a fresh look at the sociological factors affecting the development of economic thought. This is developed by Benjamin Ward in the following way:

Economic science develops along a sharply constrained trajectory. The motive-force for development is the emergence of puzzles, which in turn is caused by the proposing of solutions to previous puzzles, and by transforming the issue of the time into the language of economic science. Constraints to the path of development come from the focusing devices, including the evolving tradition of acceptable stylized facts, the underlying worldview economists have in common, and the constraints imposed by power in the normal science social system and its environment. (Ward 1972, p. 31).

This article does not intend to criticize Ward's view, but to enhance it by focusing on those aspects to which Ward alludes when he speaks of constraints imposed by power in the environment.

More specifically, two theses will be defended. First in the social sciences, the process of scientific construction necessarily includes a political dimension, which plays a pervasive role in the orientation of scientific activities, second, in a class society, the ruling class cannot be indifferent to the type of social science developing in the society in which it holds power.

In an effort to illustrate these theses in the case of economic science, the factors which led to the transition from classical to neoclassical economics will be examined. The analysis will be structured in Kuhnian terms, but supplemented with the political connections which will be outlined hereafter. We will argue that this transition exhibits the characteristics of a scientific revolution, in the Kuhnian sense, and we will defend the view that the occurrence of this revolution is fully understandable only if account is taken of its political dimension.

INTRODUCTION

The Political Dimension

To support the first thesis, let us start by looking at the way in which scientific models are built, as described by Ronald Meek in his essay, "Marx's Economic Method".

The model-builder usually begins, on the basis of a preliminary examination of the facts, by adopting what Schumpeter has called a "vision" of the economic process. In other words, he begins by orienting himself towards some key factor or factors which he regards as being of vital causal significance so far as the structure and development of the economic system as a whole are concerned. With this vision uppermost in his mind, he then proceeds to a more thorough examination of the economic facts both of the present situation and of the past situations which have led up to it, and arranges these facts in order on what might be called a scale of relevance Taking the facts which he has placed at the top of the scale as his foundation, the model-builder proceeds to develop certain concepts, categories and methods of classification which he believes will help him to provide a generalized explanation of the structure and development of the economy The particular analytical devices which he employs - his tools and techniques, as it were - are thus by no means arbitrarily chosen. To quite a large extent they are dependent upon the nature of his vision, the nature of primary facts which they are to be used to explain, and the nature of the general method of analysis which he decides to adopt (Meek 1967, P. 93).

Implicit choices are made at the onset of theoretical construction, and they impinge upon its whole development. ² First of all, the way one defines the object of economics contains a choice that is full of consequence. Thus, to assert, as is often done, that this object is efficiency is to narrow ones view to a technocratic approach to economics and the economists role. It excludes all reference to the analysis of the transformation of economic structures from the scope and heart of the science. This order of priorities is not neutral. The effects on scientific development of the way of asking questions can further be shown in the case of two basic economic categories, the units of analysis used in a theory and the rationality of action attributed to economic agents.

Concerning the units of analysis, one of two approaches can be adopted. In the first case, one considers that social classes, that is, groups of people aggregated according to their specific relationship to the means of production, are the effective actors, shaping social and economic developments. Thus, theoretical construction must be framed in terms of classes. This is the Marxist view of historical development. It was also that of the classical political economists. On the contrary, the other approach considers that it is the individual, with his aims and tastes, who constitutes the basic unit upon which economic theory should be built. Individuals are seen as the atoms of society, and no intermediate structure between them and the aggregate society is deemed relevant.

The same duality concerns the rationality of actions. Indeed, it may be assumed either that economic units are freechoosers or that their behavior is socially determined. In the first case, human action is made equivalent to the act of a choice among alternatives. One premise here is that actors are rational. But this is only of secondary importance, since modifications easily can be introduced in order to integrate uncertainty or the possibility of foolish goals. The central premise is, rather, that behavior is regarded as the result of an individual decision. For example, if someone presents himself on the job market as a miner, this would then be explained exclusively in terms of his preferences, his utility and disutility function, his attitude toward risk and abstinence, and so forth. On the contrary, the second conception considers that social behavior is best explained in terms of social belonging and the constraints flowing from the exigencies of the system's functioning and self-reproduction, and that free decision occurs only within narrow limits.

Of course, choices about units of analysis and types of rationality are closely linked. Intentional rationality (the first aspect depicted above) is connected to the idea that individuals should be considered as the proper units of analysis and, conversely, social rationality fits in with the conception that classes are the forces active in shaping historical development. In the latter interpretation, individuals are seen as "personifications of economic categories, embodiments of particular class-interests", to borrow Marx's

expression (Marx 1967, p. 10).³

The problem is not to state in abstracto whether people are completely free or fully determined. Everyone admits that both dimensions play a role in reality. But the question is one of methodological choice. One of the two grids of analysis has to be used as the basic category of apprehension of reality.

This choice is of the utmost importance and pervades the whole scientific reasoning since it directs inquiry in quite opposed directions. Differences between paradigms lie not so much in the fact that they provide different answers to the same questions, but in the fact that they ask different questions. Once their premises are different, paradigms speak different languages. Likewise, the policy conclusions derived from analysis are predetermined by the way in which the conceptual system is framed. Because of these preliminary options about the social vision and the basic categories of analysis, social sciences cannot be neutral.

Class Interests

Our second thesis flows from the first one. If, as just described, scientific construction includes a political dimension, then, in a class society, the ruling class is not indifferent to the type of social science developing in the society in which it holds power. Hence Kuhn's view that the progress of science can be restrained by extracognitive factors, such as conservatism within a profession,⁴ must be enlarged in order to include factors relating to the power structure within society as a whole. More specifically, one should assume that a ruling class utilizes its power to influence scientific construction, either directly and blatantly or, as is more probable today, indirectly. A paradigm, the social vision of which corresponds to the interests of the ruling class, will see its developments encouraged, while on the contrary, an approach leaning against these interests will be overthrown or stifled in its growth. Class interests must be introduced in the process of scientific construction. Knowledge does not limit itself to a disinterested quest for

truth. It is also a political confrontation where opposing views of society fight each other.

The views defended here should not be labelled too quickly as environmentalist. They represent, rather, a combination of the environmentalist and absolute view of the development of economic thought. The two are joined together in the following way:

a) theories of the social sciences contain a political dimension that flows from the social vision on which they are founded. This vision influences the choice of units of analysis, the object they treat and the ones they do not;

b) the efficient development of a science does not require those professing it to be aware of these implications. One does find "schizophrenic" cases of scientists who are oriented towards the left in politics while undertaking conservative scientific work;

c) the framework of analysis once being set up, science develops according to its internal logic;

d) the development is socially controlled by the ruling classes, as already stated above, because of the political consequences of scientific statements. This leads to the encouragement of apologetic, inoffensive and technocratic theories and to the dissuasion of those that criticise the existing social order.

Kuhn's Normal Science⁵

Central in Kuhn's framework is the notion of normal science. It refers to the specific state of development of two related but distinct realities, namely, science as a social system and science as a system of ideas.

Science as a social system refers to the community, sometimes called an "invisible college", formed by scholars of a like discipline. It exists through a series of institutions, which act as support for the development of interactions and education (departments, reviews, meetings). These institutions are penetrated with social values, for example, criteria for rigorous scholarship or for admission within the profession. There is also a specific

distribution of prestige bearing upon institutions as well as upon people. In this regard, the judgment of colleagues is more important than that of the general public. Likewise, there is a structure of power, linked with the prestige elements and based upon past achievement and the holding of strategic position. Scientific communities thus constitute a well-structured in-group.⁶

The notion of paradigm expresses the unity and the coherence of a system of ideas. It encompasses the social vision, methodological principles and categories, theories, techniques and stereotyped examples all of which together make up a particular system of ideas, the content of which is reflected in textbooks. The paradigm enables scholars to concentrate on narrow fields of research without, however, losing the feeling that their specialized activities are integrated in a wider context. The system of ideas, about which there exists a general consensus in a given scientific community, is called the paradigm in dominance. Thus a normal science consists of two articulated elements : a specific scientific community and a specific paradigm.

Kuhn's main thesis is that a change of the paradigm in dominance occurs in a rather brutal way, comparable to a political revolution. The signs of a crisis are the appearance of anomalies, that is, puzzles which the existing paradigm cannot resolve. A general uneasiness about the relevance of the framework of analysis then arises. If the anomalies are not resolved and the uneasiness tempered, and if approaches involving a radically different way of looking at the problems are suggested, then the chances of a revolution will grow. However, cognitive factors are not sufficient in themselves to cause the move. Indeed, such a change does not occur in a social vacuum. The power elite within the profession is linked to the existing paradigm, Since they feel, rightly, that changes within the power and prestige structure probably will follow a scientific revolution, they may very well use their power to oppose the changes. Thus a scientific revolution is the result of forces in tension. On the one hand there are forces, usually of a cognitive order, pushing for a break; on the other there are forces, either cognitive (the ability of a existing paradigm to broaden its scope in order to integrate anomalies) or social, which will work against the successful occurrence of the scientific revolution.⁷

Given this interpretation of Kuhn's view, we enter the heart of our subject. The classical and neoclassical paradigms will be described in turn, and the factors explaining the transition from the former to the latter will be discussed.

THE CLASSICAL PARADIGM

The classical period in economics generally is delineated by two occurrences: the publication in 1776 of Adam Smith's *Wealth of Nations* and the publication in the 1870s of the fundamental works of the marginalist theory constituting the core of the neoclassical period.⁸ During the classical era, economics was firmly erected into a distinct science. Schumpeter's judgment about what happened in this regard reveals a prescience of the notions of paradigm and invisible college.

The study of economic phenomena was not yet a full time job and few people were economists and nothing else : many were businessmen , or public servants, or journalists, and even the academic teachers of economics, in many if not in most cases, also taught cognate - or even completely different - subjects. Nevertheless, we have a right to speak of a rapid process of professionalization that went on during that period : from the first, economics had established its claim to a definite field of research; it had become a definite speciality: it used definite methods; its results gained in definiteness; and economists, even though fractional personalities, recognized one another and were recognized by the public, more definitely than before. New political economy societies were founded; new journals, new journals, new dictionaries and new bibliographies appeared - all of which, however, meant only continuation of previous practice. The study of the history of economic thought made a vigorous start and there was, of course, a rising tide of textbooks. (Schumpeter 1954, p. 384).

To translate Schumpeter's view in the Kuhnian framework, the rise of classical economics witnessed the formation in England of a normal science, although still at an incipient stage. On the one hand , a distinct scientific community of economists was developing and becoming recognized as such, even if not yet professionalized. On the other hand, a consensus existed among these people about the field in which they inquired, the questions they asked, and the main concepts and categories which they used in order to answer these questions.

Thus , one already may speak of a "paradigm in dominance. " In order to describe it, the following features will be outlined: 1) the object of economics; 2) the general aim for engaging in scientific activities; 3) the institutional framework and the units of analysis; 4) the core of their conceptual framework; 5) the conception of value; 6) the conception of profit.

The Object of Economics.

As stated by Schumpeter, classical authors had a precise idea of the field assigned to economics. It may be called a substantive view as opposed to the formal one, which later on would characterize their neoclassical followers. For the classicists , the object of economic science was to determinate the genesis of wealth and the laws governing its distribution. Since they regarded accumulation of capital as the main cause of the increase in wealth, their analyses primarily were aimed at explaining the nature and effects of the accumulation process.

The Aim.

This definition of their field of interest must be related to the goal which they engaged in scientific activities. According to Meek, "classical political economy was primarily concerned to assist those policy-makers who aimed to increase the wealth of nations. Its main task was to discover the relevant laws relating to the origin and increase in wealth and to propound them in such a way as to define the 'areas of decision' open to the policy - makers" (Meek 1973, pp. 83-84). Their objective was not at all to set up a general theory which purported to be universally valid. Rather, they sought to explain the workings of the system in which they were, hic et nunc involved. Therefore, they really do deserve the denomination of political economists .

The institutional Framework and the Units of Analysis.

The importance which classical authors attributed to the institutional framework follows as a logical consequence of their aims. On the one hand, they never failed to specify the institutional contexts in which the economic processes were supposed to occur; on the other hand, they also normatively worked out the institutional conditions necessary to foster accumulation. With regard to the choice discussed above of a unit of analysis, their stand was clear. Social classes constituted one of their fundamental categories. As is well known, three classes were retained, the landlords, the workers, and the capitalists, each receiving a specific revenue, that is, rent, wage, and profit, respectively. Capitalists were assigned the dominant role. As Robert Eagly states : "Capitalists lead; all other groups in society follow. Laborers and landlords though naturally indispensable for economic activity, are assigned negligible roles as decision makers. Analysis is conducted in terms of aggregate or class units. Although allusion is not infrequently made to individuals (generally for purposes of illustration), classical economic theory had no place for the common man" (1974 a, p. 135). Relationships between classes were at the core of their analyses.

Their conception of capital.

Given their interest in accumulation, the notion of capital was quite naturally central to the classicists whole conceptual framework. To demonstrate this centrality was Eagly's main objective in his recent work, The Structure of Classical Economic Theory. According to him, the unity of the theory, in its internal structure, was the direct consequence of the capital concept. "Capital provided the central schema or analytical structure that gave a sweeping overview of economic processes and provided a mode of analysis that served as the main vehicle for progress in economic theory from 1759 to the end of the 19th century" (Eagly 1974 a, p. 34).

Strikingly, the classical authors defined capital in a comprehensive way (in comparison with the neoclassical acceptance). It included machinery as well as raw material and labor, and one of their leading problems consisted precisely in the allocation of the total capital stock between fixed (machines) and variable (raw materials plus a wage fund) capital. "The basic Classical model concentrated on working out the details of the production process. Output was specified to be a function of previously accumulated capital stock . . . At the outset of this process the economy's total stock of commodities is in the form of capital stock; and at the end of this process the total stock of commodities takes the form of fixed capital plus (unmarketed) inventories of commodities" (Eagly 1974 a, p. 4). Thus , the classicists used a "period-analytical structure," or "compartmentalized analysis , " in which they singled out production and exchange for separate and sequential treatment. The factor market and the product market tended to be treated as largely independent of each other. "Capital accumulation is regarded as prior to production and production as prior to exchange of commodities" (Eagly 1974 a, p. 131).⁹

Their Conception of Value.

Given the purpose of this article, the classical theory of value deserves particular attention for two reasons. First because as Meek asserts "the particular theory of value with which an economist begins, is almost invariably a sort of shorthand expression of the basic attitude which he is going to adopt towards the phenomenon he seeks to analyse and the problems he seeks to solve" (Meek 1973, p. 244).¹⁰ Second, charge in the value question brought about the scientific revolution from the classical to the neoclassical paradigm.

No unique theory of value can be ascribed to all the classical authors. Nevertheless, their treatment of the subject exhibits some common features enabling one to contrast their approach to that of their neoclassical followers. First, the determination of value was explained in terms of production rather than exchange. Thus they emphasized cost and supply rather than utility and demand.¹¹ Second, the view underlying their analyses was that the economy must be regarded as a social process and that value is to be linked with the division of labor within society. To borrow Meek's terms, "the classical labour theory grew up in direct association, not so much with the Lockean theory of property rights as with the concept of the social division of labour. In essence, it was another way of saying that the relations between things which manifested themselves in the sphere of commodity exchange was dependent upon the relations between men which manifested themselves in the sphere of commodity production" (Meek 1973, p. 126).

Within these boundaries, however, there were marked differences in the classical treatment. As is well-known, Adam Smith believed that a pure labor theory of value was valid in a primitive state of economic development, but not in modern times. In the latter case, in Meek's interpretation of his thought, "the 'regulator' of value was no longer the quantity of embodied labour: it should rather be sought by enquiring into the manner in which the equilibrium levels of wages, profits and rent which make up the 'natural price' were determined. And his own inquiries into this problem seem to have been conducted on the assumption that the constituents of the natural price could legitimately be regarded as independent determinants of value" (Meek 1973, p. 71).

David Ricardo's reflections on value were directed at criticizing Smith's position, and undoubtedly he took an important step in the direction of a pure labor theory of value. However, his views were rather ambiguous. On the one hand, as argued by Piero Straffa (1961) and Meek (1973), he persisted to the end of his life in "his deep-rooted feeling that in spite of all appearances to the contrary, embodied value did in some significant sense constitute and regulate the 'value' of a commodity". (Meek 1973, p. 119).

He entirely rejected Smith's view that the labor theory was valid only in primitive times and had to be replaced by some sort of "cost of production" theory, once capital accumulation had taken place. On the other hand, he had to admit that his law of value held only under the drastic assumption of similarly constituted capital (same durability of fixed capital and same proportions of fixed to variable capital.) This restriction paved the way for a cost theory of value, if not in his eyes at least in those of subsequent interpreters.¹² As wittily noted by Mark Blaug, "Ricardo was the first to show just why a labor-cost theory cannot fully account for the relative prices of reproducible commodities under perfect competition" (1968, p. 96).

In the light of the aims of this article, these more recent interpretations of Ricardo's writings are not as important as those made in his time. In this regard, two features should be noticed. First, Ricardo's ideas dominated the economic scene in England, at least until 1830. From this date to the end of the century, they declined progressively before being finally overthrown by the neoclassical revolution.¹³ Second, Ricardo's ideas received radical extensions, which he himself certainly did not expect. One such extension was that of the so-called Ricardian socialists, like William Thompson and Thomas Hodgskin who wrote in the 1820s and 1830s. They presented a simplified interpretation, ready-made for political action, according to which labor was the sole cause of value and thus deserved the entire value of production. Another extension with deeper theoretical effects, was that of Marx, who put his theory of value under Ricardo's paternity. It is not our purpose to expose in detail these extensions of Ricardo's theory of value. What matters here, is that they were made in a radical perspective. This fact is important for assessing the causes of the scientific revolution which overthrew the whole Classical construction.

Their View on Profit.

In the classical view, capitalists' contribution to production consists of an advance of wages made necessary by the division of society into classes. Indeed,

as the workers were not provided with wealth, they could not subsist during the period between production and commercialization of the finished products and therefore needed advances from the capitalist. Profit was viewed as the reward for these advances; its level depended upon the consumption habits of capitalists, which determine the amount that they were able to invest into wage-funds and the price at which labor was paid. However, the classical authors did not condemn the profit the advances yielded. For them, it was rather the propulsive force of economic growth. As Joan Robinson puts it, the basis of the classical view is that, "in a hard-headed way (it) recognized exploitation as the source of national wealth" (1962, p. 58). Acting in their own self-interest, capitalists automatically would lean toward an increase in the collective wealth.

THE NEOCLASSICAL PARADIGM

During the classical period, economic science had not yet reached the stage of a fully developed normal science. The community of economists was still small and its boundaries were vague. Consequently, intellectual production was neither abundant nor specialized. This is not the case for the neoclassical period. In the 1870s, the founders of the new school published their main works.¹⁴ However it was not until the very end of the nineteenth century that the neoclassical paradigm became dominant. Thus, the turn of the century witnessed both the same time a rapid development of the economic profession and a change of paradigm.¹⁵ These two developments should not be confused, contrary to the view sometimes held that the "marginal revolution" was nothing more than a process of professionalization.¹⁶ This point will be dealt with in the last part of the article. First, let us outline the characteristics of the neoclassical paradigm according to the criteria used for defining the classical approach.

The Object of Economics.

This rise of the neoclassical paradigm was accompanied by a change

in the field of study assigned to economic science. Attention no longer was focused on economic growth, as in the classical perspective, but on efficiency, that is, on optimal allocation of scarce resources among alternative uses. As Stanley Jevons said, the "problem of economics" was : "Given, a certain population, with various needs and powers of production, in possession of certain lands and other sources of material : required, the mode of employing their labor which will maximize the utility of the produce" (quoted in Blaug 1968, p. 300).

The Aim for Engaging in Economic Research

Breaking with their predecessors, neoclassical economists no longer were interested in helping policy-makers. As G.S. Stigler has noted (1972, p. 577), they turned their backs on the "journalistic crisis of the day or the decade" and focused on more abstract objects of research. Assuredly, this shift was influenced by the major triumphs in the natural sciences in the nineteenth century.¹⁷ What they were looking for was a general theory, universally valid, applicable to all social systems. The specification of the institutional framework, which was so important in the eyes of the classicists was neglected. The political aspects of economics also gradually became separated from the so-called scientific aspects, the latter being limited to the observation of reality. Neoclassicals advocated laissez-faire, but without specifying, as the classical authors did, the social conditions necessary for allowing its correct working.¹⁸

The Institutional Framework and the Unit of Analysis.

To borrow Eagly's expression (1974a), the new paradigm involved a "complete recasting of the DRAMATIS PERSONAE of economic analysis". The capitalist class was removed from the center of the stage. Capitalists, defined as mere owners of capital stock and as distinct from entrepreneurs, were put on the same level as laborers and landowners. As a matter of fact, the analysis no longer was framed in terms of classes, which no longer figured

in this approach. Individuals were the only units of analysis, and their behavior was explained solely in terms of subjective rationality.

The neoclassical paradigm reduces all the elements entering the explanation to a common denominator. Only one aspect of actual phenomena is retained, their economicity, that is, the fact that they bear utility or disutility and are thus exchangeable. The classical framework consisted of irreducible categories, as social classes with their specific revenues, factors of production, production and distribution. In contrast, the neoclassical paradigm transcends specificities. Due to the introduction of new analytical tools (notions such as marginal increase or marginal rate of substitution) and to the use of algebraic reasoning, the explanation is made in terms of one unique principle: the maximization of subjective satisfaction.

If the social structures vanish from the scene, then there only remain what Eagly calls the "general public". Through its votes in the market it becomes the real decision maker.

By specifically setting down decision criteria or behavior guidelines for members of the general public, the marginal utility approach permitted a calculus in which the vast majority of the general population would participate in voicing their preferences and voting their income in the market place. It provided the basis for analysis of demand decisions in the commodity market as well as the basis for study of supply decisions in the factor market. In a sense, the marginal utility approach democratized economic theory and made every person influential, to some degree, in the outcome of economic activity" (Eagly 1974a, p. 137).

Thus exchanges are supposed to occur in a social vacuum. Several decades ago Dobb pointed out the underlying premise of such a model: "it implies that economic phenomena are ruled by a series of contractual relations freely entered into by a community of independent individuals, each of whom knows well what he wants and has access to and knowledge of all the available alternatives" (Dobb 1972, p. 65). Is this assumption correct? What are its ideological implications? These are questions to which we will have to return in the last part of the article.

The Central Concept of the Neoclassical Paradigm.

On the conceptual level, the neoclassical paradigm shifted emphasis from the notion of capital, which was central to the classical paradigm, to that of price. Indeed, the determination of the equilibrium relative prices of goods and factors becomes the main task of economic analysis.

This relegation of capital to a secondary position has been ably described by Eagly,

"The Walrasian definition of capital originated in the analytical character of the instantaneous general equilibrium system. Specifically, Walras eliminated the variable capital component from the classical concept of capital. The goods that made up variable capital (wage goods and raw materials) were merged with the income flow of a single time period. For Walras, capital consisted narrowly of fixed capital : i. e. , goods which enter production but are not used up in a single time period. Prior accumulation of the commodities which constituted variable capital was thus no longer required by economic theory. Accordingly, the responsibility formerly assigned the capitalist class dropped from sight and received no further attention beyond the Austrian school. It was, in other words, Walras' new definition of capital, not any recantation by John Stuart Mill, that killed the wages fund component of classical theory. The period analytic approach of the basic classical model no longer served as the means for dealing with the allocation of the total capital stock. The allocation of total capital stock no longer existed as a theoretical problem. Wage income, for instance, became transformed into a flow from current productive activity rather than a division of an already accumulated capital stock for current production. The close identification between labor's current productive activity and labor's wage, which was made possible by Walras's instantaneous system, was a short step removed from the marginal productivity theory. In the classical system, labor is paid a wage that is determined through the equilibrium measure of marginal (value) productivity. Labor is paid out of current, not past, output." (Eagly 1974 a, p. 7-8).

Thus, the sequential approach of the classical authors was removed and replaced by the idea of a simultaneous interdependence culminating in the notion of general equilibrium. To quote Eagly again : "Walrasian general equilibrium, in its essential aspects, joins together the factor market and product market in a system in which equilibrium in both markets is simultaneously

established. Time lags, such as existed in classical analysis, are eliminated" (Eagly 1974 a, p. 132).

The Concept of Value

The originality of the neoclassical paradigm in respect to its classical predecessor also appears clearly from the examination of its treatment of value. As is well known, in the neoclassical approach the value of a good is determined by the marginal utility of its buyers. Later, the concept of utility itself was abandoned, but fundamentally its subjective underpinning were retained. This change in the theory of value involves, in fact, a radical transformation in the vision of the economic process. In the classical paradigm, economic action was, before all, viewed as a social process. Value was analyzed within the framework of production, viewed itself as a social process whose features are the result of a specific social system. On the contrary, in the neoclassical paradigm, the origin of value is searched for in a mental process. Value depends upon of the consumer's desires.

The Concepts of Profit.

Capital and labor now are considered on the same level. Both are productive factors. Profit no longer is equated with an exploitation made possible because of the unequal distribution of wealth between classes, but is viewed as the remuneration of a subjective cost which is as real as wages. Profit becomes the reward for the capitalists' abstinence and thus receives an explanation in purely subjective terms.

THE POLITICAL FOUNDATION OF NEOCLASSICAL ECONOMICS.

After having outlined the main features of the two paradigms, we shall now devote the last section of this article to the examination of three questions. The first concerns the nature of the change between classical and neoclassical economics. Does it manifest the thorough change of perspective

linked with the idea of a scientific revolution? Was it, in other words, really a scientific revolution? The second question bears on the timespan over which the change occurred. The third concerns the causes of the change.

The Nature of the Change.

It seems clear from the above discussion that classical and neoclassical economics each constitute a coherent and specific paradigm. To repeat an earlier statement: They do not provide different answers to the same questions; they ask different questions. Table 1 summarizes the main characteristics of the two approaches. The transition actually concerned really the premises of analysis, and thus, it must be regarded as a scientific revolution à la Kuhn rather than as a scientific advance in a Popperian way through a process of criticism and falsification of existing laws or assumptions.¹⁹

The Timespan of the Revolution.

One must avoid a naïve interpretation of the Kuhnian concept of revolution, which would equate a revolution and a coup d'état, to borrow a political analogy. In our opinion, it does not denaturate Kuhn's view to regard scientific revolutions as processes rather than instantaneous events. In this perspective, the following turning points and phases can be pointed out in the case under study.

The first and, in our view, main blow against the classical paradigm came in the 1830s. The targets of the attacks were some pillars of the Ricardian theory: the class connotation of the economic categories, the concepts of value which viewed work and profit as a kind of surplus, and the limits of the progress of capitalism.²⁰

These attacks were quite successful. According to Meek, they led to the result that "Ricardo's system was purged of its more obviously disharmonious elements, particularly those which might have been used to suggest that there was a real conflict of economic interest between social classes under

Table 1. A comparison of the Main Features of the Classical and the Neoclassical Paradigm.

	Classical paradigm	Neoclassical paradigm
The object of economics	Accumulation and distribution	Efficiency
The aim for engaging in economic research	To assist policy-makers	The discovery of universal laws.
Institutional framework and unit of analysis	Specification of the institutional framework, especially in terms of the division of society between social classes. Behavior expresses class belonging.	No classes, but a "general public" making decisions through votes(individually)in the market. The idea of choice is central
Core of the theoretical structure	Capital, defined in a comprehensive way, is at the center of the theoretical structure	Prices form the central concept
Conception of value	A production theory of value, in which value is viewed as the expression of the social division of labor	Value flows from the subjective mental evaluation of the individual agents
Conception of profit	Profit results from the unequal distribution of wealth between classes; it is the source of growth.	Profit is the reward for abstinence

capitalism, or that progress under capitalism might be limited for some other reason " (1967, pp. 72-73).

The rapidity which Ricardian views, until then commonly accepted, were abandoned, is amazing. As elliptically depicted by Schumpeter: "Ricardo died in 1823. In 1825, Bailey launched his attack that should have been decisive on the merits of the case. Actually it was not, for schools are not destroyed so easily. But the decay of the Ricardian school must have become patent shortly after, for in a pamphlet published in 1831 we read that there are some Ricardians still remaining. In any case, it is clear that Ricardianism was then no longer a living force" (1954, p. 478).

Schumpeter's view about the end of Ricardianism has not been shared by everyone and many authors would rather place the turning-point between classical and neoclassical economics in the 1870s, during which decade the marginal utility theory was formulated.²¹ However, these two conceptions easily can be reconciled by regarding the 1830s as the landmark of the negative or destructive phase of the revolution and the 1870s as that of the constructive phase.

In between there was a long period of hybrid equilibrium. It was a sort of interregnum between the ancien regime and the nouveau regime. The dominant figure was J. S. Mill, whose Principles of Political Economy "functioned as the undisputed bible of economists during the second half of the 19th century", to borrow Blaug's expression (1968, p. 180). Mill himself thought he was only qualifying Ricardo and was not aware of the long term consequences which would result from the infiltration of subjective elements into the Ricardian system. More precisely, he did not realize that the labor and the subjective theories of value, which he tried to synthesize, belonged to opposed methodological approaches. Indeed, the labor component of his theory of value was linked to a definition of economic processes as relations between classes. On the contrary, the subjective component depended on a vision in which the object of analysis was the relation between the individual and his desires.

The subjective approach, first introduced in explaining the rewards to capitalists for abstinence, received its full theoretical elaboration in the 1870s. Jevons, Menger, and Walras discovered simultaneously but independently the principal of diminishing marginal utility, which was to become the fundamental buildingblock of the new microeconomics. However, as pointed out by Blaug, "the significance of the marginal utility theory was that it provided the archetype of the general problem of allocating given means with maximum effect. It was not long before the same approach was extended from the household to the firm, from the theory of consumption to the theory of production. The theory of utility supplied most of the excitement of discovery in the seventies and eighties, but it was the introduction of marginal analysis as such that marked the true dividing line between classical theory and modern economics" (1968, p. 299). Hence it is not utility theory in itself which is central for grasping the essentials of the neoclassical paradigm (and this specific theory has lost much of its prominence to days). What is central are the categories on which it was built, namely, the definition of the economic process as a relationship between the individual and his needs, the absence of class consideration, the identification of economic behavior with an act of individual choice. The object of our attention must be the rise of subjectivism, a new social vision and set of methodological principles, rather than the particular form in which this subjectivist approach became embodied, that is, the theory of marginal utility.

The Causes of the Scientific Revolution.

What were the causes of the transition to neoclassical economics? One popular position identifies neoclassical economics with "modern economics", the connotation being that only the latter is really scientific. 22 The passage to modern economics is then regarded as an entry of economics into the very select club of modern science, the criterion for admission being a high level of generality and of conceptual rigor. This attitude was probably in the back of J. M. Keynes' mind when, in his Essays of Biography, he wrote about Jevons that he was "the first theoretical economist to survey his

material with the prying eyes and fertile, controlled imagination of the natural scientist" (quoted in Collison Black 1972, p. 369).

A related type of explanation is advanced by writers focusing on the professionalization of economics, which took place at the turn of the century. One prominent example of this position is provided by Stigler, who explains the adoption of the marginal utility theory in terms of the rise of new values as the discipline became increasingly academic. "What utility contributed was precisely the values we attribute to the academic world and in particular to the academic science" (1972, p. 578) (these values mainly being generality of major results and cultivation of scholarly techniques).

However, it appears that this explanation remains at the surface of the problem and cannot be accepted. First it minimizes the differences between the two paradigms, as revealed in the following quotation, extracted from Stigler: "The marginal utility revolution of the 1870's replaced the individual economic agent as a sociological or historical datum by the utility maximizing individual. The essential elements of the classical theory were affected in no respect" (1969, p. 225). As the reader will easily understand, this view is at the opposite pole of the interpretation developed here. Stigler regards the passage toward the subjective theory of value as a Popperian progressive change, while we take it as a radical discontinuity that implied a complete reversal of the social vision involved and the methodological categories used.

Furthermore, and this is our second criticism, we would consider that the approach in terms of modernization does not provide an explanation in depth of the reasons for the change. Indeed, it evades what appears to us as being the heart of the matter, namely: what was the rationale behind the sudden abandoning of the Ricardian concepts in the 1830s? Once this question is raised, a new field for conjecture opens, and the political dimension of scientific discussions comes to the front as a new explanation for the shift in paradigm. This has been shown by Meek in his well-documented study, "The Decline of Ricardian Economics in England," reprinted in Economics and Ideology.

The context of increasing social trouble in which the attacks against some of the main aspects of the Ricardian system developed has been described

by Marx in the following way:

With the year 1830 came the decisive crisis. In France and in England, the bourgeoisie had conquered political power. Thenceforth, the class-struggle, practically as well as theoretically, took on more and more outspoken and threatening forms. It sounded the knell of scientific bourgeois economy. It was thenceforth no longer a question, whether this theorem or that was true, but whether it was useful to capital or harmful, expedient or inexpedient, politically dangerous or not. In place of disinterested inquirers, there were hired prize-fighters; in place of genuine scientific research, the bad conscience and the evil intent of apologetic (1967, p. 15).

The labor theory of value and the origin of profit were at the center of the debate. Ricardo had built up his theory of value from the idea that it was the expenditure of energy by the workers which conferred value on commodity rather than the capitalists' expenditure on subsistence goods for their workmen. Now, as already has been noted, socialist authors pushed this theory to its more radical conclusions. They argued that if one considered labor as the only source of value, it appeared logical that workers be entitled to receive the totality of the product of their work. Nothing justified an important portion of produce, namely profit, accruing to the capitalists. Thus the Ricardian doctrine provided an important intellectual argument to the socialist movement, which was in full development at the time and which questioned the moral validity of the existing social order. It also did not take long before the conservative forces discovered the political content of the Ricardian doctrine. It therefore became imperative for the bourgeoisie (to which most of the economists belonged) to eliminate these views. Meek writes: "It is hardly too much to say that every new development in economic thought in England about this time had the objective effect of cutting the ground under the feet of writers like Hodgskin and William Thompson" (1967, p. 70). He adds that "it seems not too unfair to say that economists like Scrope, Read and Longfield, in varying degrees, tended towards the view that if a doctrine inculcated pernicious principles", if it denied that wealth under free competition was consigned to its proper owners, or if could be so interpreted as to impugn the motives or capacity of the Almighty, then that doctrine must necessarily be false. Their fundamental

approach, in other words, was determined by a belief that what was socially dangerous could not possibly be true" (1967, p. 71)

CONCLUSION

These are the opposing views about the causes of the transition from classical to neoclassical economics. The author adheres to Meek's analysis because it provides a coherent answer to the central question as to why the classical approach was dropped. The other view does not even consider this question, for it assumes, by definition, that the new theory of value is more scientific.²³ Thus, in our opinion, the deep rationale underlying the attack against the Ricardian theory of value was that it led to radical conclusions. The urgent task was to discard a theory which was justifying a radical transformation of society. We face here a clear example of a contradiction between a theoretical framework leading to radical conclusions and the power structure within society, in which the bourgeoisie had become the dominant class. The stumblingblock or anomaly within the classical paradigm lay in its political consequences. Therefore it was necessary both to discard the disharmonious elements of the Ricardian approach and to propose a justification for profit.²⁴

This was exactly the function played by the neoclassical scientific revolution. The new paradigm was especially attractive because it looked as scientific as the natural sciences theories, while it eluded the dangerous topics of class interests and transformation of the system. It left aside the theoretical categories which could apprehend the specific characteristics of the capitalist mode of production. Thus, it simply was unable to frame any question about a possible change in the structures of the system. It provided tools for the management of the economy in the framework of the existing social order, as if this was the only possible object of economics. This inoffensiveness was and is, from the viewpoint of the capitalist ruling class, the main quality of the neoclassical paradigm. Political economists are transformed into engineers. .

The new paradigm, in which the term political economy is replaced by economics, does remain political, in the sense that by hiding the political dimension of economics, it plays a very definite political role. This was shown, a long time ago, by Dobb.

The assumption is that each individual had free range of opportunities and had only taken the road he had after surveying and estimating the range of existant alternatives. This is what cannot be postulated of capitalist society; and it is the absence of this assumption - indeed, the existence of the direct opposite, namely class division - which forms the necessary starting point for any understanding of the specific character of capitalist society. (1972, p. 70). The very form in which abstract postulates about individual choices are put constitutes them a distorted description of the actual forces which control economic phenomena in capitalist society, unless they are radically qualified by statements concerning the social relations by which individual choices are governed and the choices of classes are differentiated in capitalist society. The mere absence of any such qualification means that the statement that individuals choose, as soon as it is made concrete in the form that individuals choose in a particular way, becomes the false statement that individuals choose freely and that the events which are the outcome of these individual actions are unaffected by those basic productive relations class relations connected with ownership of economic property which are the distinguishing characteristic of capitalist society. (1972. p. 75).

NOTES

1. See A.W. Coats (1969), D.F. Gordon (1965), Review of Radical Political Economics (1971), Benjamin Ward (1972), Robert Heilbroner (1973), Hyman Cohen (1973), Martin Bronfenbrenner (1971), Leonard Kunin and F.S. Weaver (1971), Siegfried Karsten (1973), and R.D. Collison Black et al. (1973).
2. See Gynnar Myrdal's book, The Political Elements in the Development of Economic Theory: "Facts do not organize themselves into concepts and theories just by being looked at; indeed, except within the framework of concepts and theories, there are no scientific facts but only chaos. There is an inescapable a priori element in all scientific work. Questions must be asked before answers can be given. The questions are an expression of our interest in the world, they are not bottom valuations. Valuations are thus necessarily involved already at the stage when we observe facts and carry on theoretical analysis, and not only at the stage when we draw political inferences from facts and valuations" (Myrdal, 1954, p/ VII). The same view is also developed by Lucio Colletti (1972). For an opposite view see Stigler's article, "The Politics of Political Economists", reprinted in his Essays in the History of Economics (1965).
3. The same theme is developed by Maurice Godelier in his book, Rationality and Irrationality in Economics (1973).
4. Examples of this can be found in Robert Merton (1972) and Michael Mulkey (1972).
5. Kuhn himself often has been accused of conceptual confusions. See Imre Lakatos and Alan Musgrave (1970).
6. For the sociology of scientific communities see Barry Barnes (1972), Robert Merton (1973), Diane Crane (1972), Joseph Ben-David (1971) Bernard Barber (1952). Interesting remarks are also to be found in Ward's book, What's Wrong With Economics? (1972) and in, Eagly's article, "Contemporary Profile of Conventional Economists" (1974 b).
7. For further development and application of these ideas to economics, see Wards' What's Wrong With Economics? (1972).
8. The above delineation is, of course, somewhat arbitrary. In his important book, The Structure of Classical Economic Theory. (1974) Eagly regards François Quesnay's Tableau économique as the start of the classical theoretical structure.
9. Adam Smith did, however, sometimes refer to the impact of changes in product prices on factor markets. See Smith (1904), chapters VII and VIII.

10. The same view is held by Myrdal (1954, p. 15).
11. Malthus and Nassau Senior were exceptions in this regard.
12. See Stigler's well-known article, "Ricardo and the 93 Per Cent Labor Theory of Value", reprinted in his Essays in the History of Economics (1965).
13. See Joseph Schumpeter (1954), Ronald Meek (1967) Marc Blaug (1968), Frank Fetter (1969), and Gordon (1965).
14. Carl Menger (1871), Stanley Jevons (1871) and Leon Walras (1874--77).
15. See Stigler's "Statistical Studies in the History of Economic Thought", in his Essays in the History of Economics (1965)
16. See Stigler (1972).
17. See Collison Black (1972) and Stigler (1972).
18. The changes both in the object of economics and in the general aim of research possibly could be explained by the state of development of the capitalist system . During the classical period, the capitalist class was still emerging as the new ruling class and needed intellectual support to back its ascension. At the time of neoclassical economics, its power position already was well established, and this support was no longer needed that much
19. For a confrontation of scientific progress à la Popper and discontinuities à la Kuhn, see Lakatos and Musgrave (1970)
20. See Schumpeter (1954, p. 552) and Meek's " The Decline of Ricardian Economics in England," reprinted in Economics and Ideology and other Essays (1967, p. 72). For an opposite view, according to which the concept of value was not central in Ricardo's theory, see Fetter (1969).
21. See the special issue of History of Political Economy on the "Marginalist Revolution in Economics" (1972).
22. Examples of this position are to be found in Schumpeter (1954) and Blaug (1968, 1972).
23. A good example of this attitude is again given by Stigler: "It is indeed true that a believer in the labor theory of value could not get a professorship at a major American university, although the reason would be that the professors could not bring themselves to believe that he was both honest

and intelligent." G. Stigler; "The Politics of Political Economists", in Essays in the History of Economics (1965, p. 58).

24. As Joan Robinson wittily says:
"Adam Smith hard-headed view that the landlord and the master muscle in and take their share, will not do for a more pious generation. Capital must be allowed to create the value that it receives" (1962, p. 34).

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