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Political
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Classical and Marxian Political Economy

Essays in Honour of Ronald L. Meek

Edited by

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Ronald L. Meek

Professor Ronald L. Meek, Tyler Professor of Economics at the University of Leicester from 1963, died suddenly on 18 August 1978 at the age of 61. George Houston, Professor of Political Economy at the University of Glasgow and a close friend of Ron Meek for many years, writes:

'In saying a few words about Ron's life I shall inevitably be remembering him mainly as he was in Scotland. I make no apology for this; in his inaugural lecture at Leicester he claimed to be a naturalised Scot, though in fact his thirty years as a university teacher in this country were divided equally between Glasgow and Leicester.

'Ronald Meek was born in Wellington, New Zealand in July 1917. He went to school and university in New Zealand in the 1930s, first to read law and then later to study economics before coming to Cambridge in 1946 with a Strathcona studentship to read for a Ph.D. under Piero Sraffa. In October 1948 he moved to Glasgow to take up a lectureship in the department of political economy. In 1963 he was appointed to the Tyler Chair of Economics at Leicester, an appointment which I am sure must have been partly the result of Fraser Noble's close knowledge of Ronald's talents as a lecturer, teacher and scholar.

'I've met many Glasgow graduates from Ronald's time and everyone placed him top of their list of lecturers in economics. He put an enormous amount of work into all his lectures — at whatever level — and was a model teacher in ways which his colleagues sometimes found it difficult to live up to. In scholarship he quickly established himself not only as an authority in his special fields but also as a splendid writer, and over the years his many books and articles on the Physiocrats, on

Malthus, Smith and Marx have made his name very familiar to fellow-scholars and students all over the world. But he was no narrow specialist. His first work was on the Maori problem and his last work, which he hadn't quite finished, was on matrix algebra.

'Ron was a humanist: he believed, in his own words, that "man can now begin, with full consciousness, to make his own history . . . All that is at issue is whether . . . *we* will make it well or ill." In New Zealand and in Britain he was for many years active in the socialist and communist movements. He was an outstanding teacher of Marxist economics and took many classes of Clydeside workers in the late 1940s and 1950s and is still remembered as a speaker and teacher of great clarity and integrity who was always able to explain ideas simply and clearly without ever covering up the difficulties and problems.

'In Leicester he widened the scope of his writings in economics, though at first he devoted a great deal of time to building up the economics department. He was largely responsible for the introduction of the B.Sc. degree course in Economics and also for the inception of the Public Sector Economics Research Centre. After giving up the headship of the department, his written output was prodigious and he published at least a book a year on a wide range of topics. Outside the university one of his most treasured interests was in the theatre (in which he had been involved in New Zealand) and I know he was very pleased to have been on the board of the Haymarket Theatre in Leicester.

'Ron was primarily an economics scholar, however, and perhaps I could mention one particular piece of scholarship which Ronald undertook while at Leicester but which kept him in close touch with us in Glasgow. It typifies his character and approach to work. The bicentenary of Adam Smith was to be marked by several publications, one of which was going to be onerous, indeed tedious to prepare. A set of student notes for Smith's lectures in Jurisprudence had become available, the text had to be deciphered, annotated, edited and matched against Cannan's version. Although joint author with David Raphael and Peter Stein, Ronald accepted the main responsibility for the volume, especially the text, and he spent

hours and hours on that text in the most meticulous checking and counter-checking. What he called his monocular vision must have made the task even more daunting for him.

'This single-minded dedication to the task at hand was reflected in many aspects of Ron's life. When he was about 40 – living in Glasgow – he decided to learn to play the piano, the kind of resolution many make at that sort of age but very few ever carry out. But Ron disciplined himself rigorously to so many minutes every day and with great persistence reached a competence which was no doubt less than he would have liked but much more than his more musical friends (and wife) believed possible.

'While music was one of his joys, his main recreation was hill-walking. If he did not get on the hills, he said, he would be insufferable. For some of us who occasionally went walking with him he was pretty insufferable *on* the hills, for he could always keep going at full tilt when most of us wanted a rest. His little book on hill-walking in Arran was a model of its kind. Written in one (very rare!) wet summer in Arran with his family it reflected Ronald's determination never to waste any time. He was restless when he wasn't doing anything active – mentally or physically.

'Even when he relaxed with his friends his tremendous zest for living was irrepressible. The Meeks' flat in Glasgow was quite often the scene of meetings, parties or musical evenings which frequently ended in a sing-song that went on for hours. There was never any doubt about who was the star performer. Ronald had a phenomenal memory and could sing verse after verse of many long Scottish songs when the natives could hardly recall the choruses.

'Ronald Meek was a man of great dignity and distinction. His contribution to economics scholarship is secure and permanent. His sensitivity, dedication and relentless capacity for work are attributes we remember with awe and affection. If we say farewell to him too early in his years, we can also acknowledge that he did far more in these years than most of us would be very glad to achieve in two life times.

'Ron was proud to be an economist and defended his profession rationally yet passionately. Perhaps I can therefore finish with a few words that he himself spoke at the end of

his inaugural lecture at Leicester University:

> Even if the object of the economist were simply to econ-
> omise for its own sake, and nothing more, this would surely
> not be an ignoble pursuit in a world where many millions
> of people are still starving. Man, after all, does not live by
> freedom alone. But the economist does not, of course,
> preach affluence for its own sake. He preaches it for the
> sake of the good life which is impossible without the
> leisure which affluence brings with it. Economists, as
> Keynes once said, are 'the trustees not of civilisation, but
> of the possibility of civilisation'.

Ronald was a good trustee of that possibility.'

Contents

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An Introduction to Classical and Marxian Political Economy

Ian Bradley and Michael Howard

1 THE HISTORY OF ECONOMIC THOUGHT

The purpose of this introduction is to outline certain charac-
teristics of Classical and Marxian political economy for
readers who are relatively unfamiliar with this work. In doing
so a major difficulty has to be faced. The interpretation of
Classical and Marxian political economy, as well as of the
individual economists who make up these schools, is highly
controversial. No better illustration of this is provided than
the various assessments which have been made of Ricardo's
work on value and distribution. At one extreme, Marshall
(1890, appendix 1) argued that the labour theory of value,
with its implication that profit represents exploitation, was
for the most part an irrelevance and Ricardo's main achieve-
ment was to abandon it. A polar opposite view is that of Marx
(1862b), who maintained that Ricardo's analysis represented
a significant stage in the development of a logically watertight
theory of surplus value. Others, like Stigler (1958), imply
that Ricardo's affinity to Marx stems from a pragmatic com-
mitment to the labour theory, not a philosophic or even
analytic orientation. On the other hand, Myrdal (1953) and
Gordon (1959) reverse the basis of adherence. Mill (1848)
and Marshall (1890) both considered themselves part of the
Ricardian tradition. In contrast eminent historians of thought,

like Schumpeter (1954), argue that by the 1830s Ricardianism was no longer a living force. Ricardian theory, however, is not unique in this respect. A similar variety of interpretations exists regarding the work of Quesnay, Smith and Marx.

This diversity of views poses problems for any attempt to summarise the history of economic thought, but it should not be considered surprising. The economic theory of the past has to be ordered by some standards of selection, comparison and evaluation. It is in these terms that economists are grouped into schools and their work is historically judged.[1] Since such standards are diverse, so too are the interpretations to which they give rise.

In this introduction our standards of interpretation are the same as those which were adopted by Meek in his last general works on the history of economic thought (Meek, 1973a, 1977). These built on his earlier analyses within the Marxian interpretation of this history (Meek, 1953, 1956, 1962) and were greatly influenced by the contemporary work of Sraffa (1960) and Dobb (1973). The adoption of these standards has a degree of appropriateness beyond the dedication of this volume. Not only are these standards most useful for an understanding of the essays which follow but they also place into perspective the modern controversies in value and distribution theory.

The distinguishing characteristic of this interpretation is the consideration of value and distribution theory in terms of two traditions of analysis. On the one hand, there are theories of supply and demand whose principal concern has been to study the allocation of resources in the context of a price system. On the other, there is theory which has sought the basis of explanation outside supply and demand analysis and has concentrated attention on the origins, measurement and utilisation of the surplus which arises in the production activities of capitalist economic structures. Meek (1977) referred to this second body of analysis as the Ricardo—Marx—Sraffa tradition. It is not suggested that these two types of analysis developed independently or that they have been insulated from each other.[2] What is suggested is that the history of value and distribution theory can be meaningfully structured through this framework of interpretation and that

doing so throws light on the controversies which have occurred in this area of analysis.

2 THE ANALYTIC PURPOSE OF CLASSICAL AND MARXIAN POLITICAL ECONOMY

As we indicated in the previous section, the major problem which concerned Classical and Marxian political economy was the analysis of the surplus generated in the production activities of a capitalist economy. Output was divided into two components: first, that portion which was required for the reproduction of this output and, thereby, represented necessary costs of production; second, that portion which was 'disposable' in the sense that it could be consumed without affecting the reproduction capability of the system, or it could be used to expand productive capacity through accumulation.[3] Classical and Marxian political economy concerned itself with the origin, form, measurement and utilisation of this surplus.

Naturally enough in doing so both schools formulated concepts which appear arbitrary or ill-informed unless they are related to this problem. This is most clearly the case for the distinctions which were made between productive and unproductive labour. Such dichotomies are pervasive in Classical and Marxian political economy, though individual economists made the distinction differently depending on how they conceptualised the surplus. However, in most cases the basis of the distinction is clear and sensible. Productive labour is that labour which produces a surplus; unproductive labour is that which does not. Unproductive labour was not regarded as socially detrimental or useless. The utility-generating potential of its outputs was not at issue. Unproductive labour was simply regarded as labour which did not yield surplus.

There are other concepts and propositions which were developed by Classical and Marxian political economy to which this consideration is of less importance. In undertaking an analysis of the surplus, Classical and Marxian political economy did develop theory which could be easily separated from this analysis. This is true of the theories of value, coordination and accumulation which were developed. However,

in the context of the work we are concerned with, these theories were orientated towards aiding the analysis of the surplus and as such are considered from this perspective in this introduction.

The conceptualisation of the surplus did differ significantly within Classical political economy. Most renowned is the work of the Physiocrats, who confined the generation of surplus to agricultural production alone. Manufacturing and commerce were regarded as 'sterile'. The rationale for such a view can be easily appreciated from the following statement of this doctrine:

> Give the cook a measure of peas, with which he is to prepare your dinner; he will put them on the table for you well cooked and well dished up, but in the same quantity as he was given, but on the other hand give the same quantity to the gardener for him to put into the ground; he will return to you, when the time has come, at least fourfold the quantity that he had been given. This is the true and only production. (Paoletti, 1722; cited in Marx, 1862a, p. 60.)

Non-agricultural labour was therefore regarded as unproductive. It could only transform the primary products of nature into more useful forms.[4]

The belief in the unique surplus-producing ability of agriculture was therefore justified in physical terms by the Physiocrats. However, they usually conceived of this surplus as manifesting itself in the value form of land rents.[5] Their reason for doing so rested on the belief that the equilibrium wage would not rise above subsistence owing to a population mechanism which Malthus was later to popularise. It also rested on the belief that, under free competition, the equilibrium price of any manufactured commodity would equal costs of production in which profits would be non-existent or, properly conceived, would represent only necessary reproduction costs (Meek, 1962, pp. 297–312, 347–8). It was therefore the landowning class who had control of 'disposable' economic resources.

It was in terms of this conception of the surplus that the Physiocrats constructed their economic analysis and developed policy conclusions. The most famous aspect of this analysis is undoubtedly Quesnay's *Tableau Economique*, which sought to represent the interconnections between the various sectors of a market economy. This *Tableau* was based upon the assumption of the exclusive productivity of agriculture, but obviously the idea of representing the interconnections of economic activities in this way was capable of being developed independently of this assumption.[6] Samuelson's essay (Chapter 1) gives an illuminating view of Physiocratic insights from the perspective of a modern economist.

The major policy recommendations made by the Physiocrats were intended to increase the size of the surplus. The substance of these proposals concentrated on designing an appropriate taxation system, the dismantling of mercantilist restrictions on free trade and the extension of capitalist methods of agricultural production.[7] On the whole these proposals there-fore differed little from those which were subsequently made by Smith and Ricardo, though their conception of what constituted the surplus differed from that of the Physiocrats.

Smith defined the surplus in value terms as profit and rent.[8] As with the Physiocrats, the equilibrium level of wages was believed to be at subsistence level owing to the operation of a Malthusian-type population mechanism. Profit, however, was now recognised as a genuine component of the surplus which occurred normally under free competition. The distinction between productive and unproductive labour was reformu-lated as a distinction between labour whose activity generates rent and/or profit, and labour which does not. Also, just as the Physiocrats had done, Smith built his economic analysis and policy recommendations on such conceptions. This anal-ysis, together with the policy proposals, had a more enduring future than that of the Physiocrats. One reason for this, which Meek was at great pains to emphasise, was that Smith's con-ception and analysis of the surplus was encased in a new paradigm. This involved two novel features. First, there was a recognition that economic structures were historical products and the development of a theory in which these economic structures played a key determining role for all social phen-

omena. Second, the class typology was reformulated in terms by which modern society could be analysed.

The first element can be seen as the development of a materialist conception of history:

> [The] theory was that society 'naturally' or 'normally' progressed over time through four more or less distinct and consecutive stages each corresponding to a different mode of subsistence, these stages being defined as hunting, pasturage, agriculture and commerce. To each of these modes of subsistence . . . there corresponded different sets of ideas and institutions relating to law, property, and government and also different sets of customs, manners, and morals. [This] four stages theory . . . was destined not only to dominate socio-economic thought in Europe in the latter half of the eighteenth century, but also to become of crucial significance in the subsequent development of economics, sociology, anthropology, and historiography, right down to our own time. (Meek, 1976, p. 2.)[9]

Smith was an originator of this theory (Meek, 1976, pp. 99–130), but its elements were, of course, most notably and ably reformulated by Marx and Engels (1845, 1846). Moreover, in doing so, Marx tied in this conception with the analysis of the surplus much more explicitly and systematically than did Smith. Marx developed typologies of economic structures in which the method of surplus extraction was *the* defining quality. The analysis of the surplus thereby became not only the key to understanding the development of capitalism but was also pivotal to comprehending the dynamics of all types of economic structure and, thereby, all history.

However, although Marx's analysis represents the most renowned form of historical materialsm, it was Smith who, together with others like Turgot, first formulated it. Meek's painstaking researches into this formed a large part of his work, particularly in the 1970s, and it is this work which is the topic of Andrew Skinner's essay in Chapter 2.

The second element should be seen as an aspect of the first. However, to a large extent it has an independent influence in the development of economic theory so it may be considered

a separate issue. Meek (1973b, pp. viii–xii) summarised Smith's analysis, together with its significance, as follows:

> One of the crucial features of a change from one paradigm to another . . . according to Professor Kuhn, is a 'shift in scientific perception', of such a character that 'objects that were grouped in the same set before are grouped in different ones afterward and vice versa'. It was precisely a 'basic shift of perception' of this type which was the main achievement of the *Wealth of Nations*. As I see it, the really central element of that work was Smith's new division of society into landlords, wage earners and capitalists . . . Before Smith, the socio-economic structure had almost always been defined in terms of a pattern which either virtually ignored the existence of the third of these 'orders', or implicitly denied its 'great, original and constituent' character by including it in some other 'order' . . . this new way of looking at society made all the difference . . . it paved the way for the idea that the drive by the third 'constituent order' to maximise its profits and to accumulate capital was the mainspring of the mechanism of the economic process – the principal medium . . . through which the famous 'invisible hand' worked to improve human society . . . There was scarcely a single element in Smith's system which was 'new . . . [but Smith made a paradigm shift] . . . and when it has been made all the other elements fell into place – and very often into a new place. Thus it seems very unhelpful to regard Smith, as some historians have done, as a mere synthesiser.[10]

The most important economic theorists who were to utilise Smith's paradigm in the nineteenth century were Ricardo and Marx. They revised, reformulated and rejected many specific aspects of Smith's work but they remained within the over-all structure formulated in the *Wealth of Nations*. They retained both Smith's conception of the surplus and the class typology of agents in which its analysis was undertaken. Their analysis forms the subject-matter of sections 4 and 5 of this introduction. Before proceeding to this, however, further light may be shed on the nature of Classical and Marxian political economy

by reviewing the methodology typical of these schools. In order to clarify this matter we have adopted the procedure of contrasting it with the method of neoclassical economics.

3   THE METHOD OF CLASSICAL AND MARXIAN POLITICAL ECONOMY

In neoclassical theory emphasis is placed upon economic agents as *decision*-makers or *choice*-makers. Agents are classified as consumers or producers and are simply assumed to have 'tastes' or 'goals' which, subject to certain constraints, they seek to satisfy. How the content of these tastes, goals or constraints arose is not considered. Some neoclassical economists may, of course, recognise that sociological matters are important in determining agents' 'choices' but this is not explicitly taken into account in the construction of the theory. Furthermore, neoclassical economists invariably consider choice-making behaviour from a particular perspective. Decisions are assumed to be the outcomes of optimisation procedures.

This methodology is to be contrasted with that of Classical and Marxian political economy. Here agents are classified not as consumers and producers but according to the social relationships in which they participate, and their actions are determined by these relationships. There is therefore an explicit sociological basis in contrast to neoclassical theory.[11]

Second, neoclassical theory considers agents' choices in terms of the concepts of demand and supply. Consumers' decisions regarding consumption goods and producers' decisions regarding inputs are 'demands'. Consumers' decisions with respect to inputs and producers' decisions pertaining to outputs are 'supplies'. The results emanating from agents' interactions depend on these demands and supplies, and in particular equilibrium prices are determined by their balance.

Again, this methodology is not a characteristic of Classical and Marxian political economy. Instead, equilibrium magnitudes are determined by elements conceived as being independent of demands and supplies. For example, in Ricardo's work, equilibrium land rentals are determined by differential sur-

pluses over the cost of cultivation at the margin, the wage rate is determined by the costs of producing 'subsistence' requirements and commodity prices are determined by technology, so that profit emerges as a residual surplus.

This means that the structure of causation in Classical and Marxian political economy is very different from that of neoclassical economics. Exogenous and endogenous variables are different. So far as the theory of value is concerned, both Ricardo and Marx assumed that outputs and a distributional magnitude are exogenous. By contrast, neoclassical theorists, outside the confines of the pure theory of exchange, treat both as endogenous. In neoclassical theory it is demand and supply relations, together with initial endowments, which are considered exogenous, while Ricardo and Marx do not explicitly specify these at all.

Both Ricardo and Marx were most explicit on this matter. For example, Ricardo wrote to Malthus in October 1820: 'you say demand and supply regulates value — this, I think, is saying nothing'.[12] Similarly, Marx (1867, p. 538) stated:

> Classical political economy soon recognised that the change in the relation of demand and supply explained, in regard to the price of labour, nothing except its changes, i.e. the oscillations of the market price above or below a certain mean. If demand and supply balance, the oscillation of prices ceases, all other conditions remaining the same. But then demand and supply cease to explain anything. The price of labour, at the moment when demand and supply are in equilibrium, is its natural price, determined independently of the relation of demand and supply. And how this price is determined, is just the question.

Underpinning these statements was the view that 'an explanatory principle based merely on "demand and supply" was too weak to support the corollaries which a theory of value ought properly to enable one to draw' (Meek, 1977, p. 159).

Ricardo and Marx were, of course, attacking unsophisticated 'theories' of demand and supply and their statements should not be given more weight than this context warrants. Nevertheless, a similarly critical position regarding supply and

demand theory is taken by those contemporary economists who seek to reconstruct political economy on the basis provided by Sraffa's *Production of Commodities by Means of Commodities* (1960).[13] However, the reasons they adduce to support this stance are somewhat different and more refined than those of Ricardo and Marx.

Smith's position on this issue is ambiguous. His economics contains both the elements of value and distribution theory which Ricardo and Marx were to work into more rigorous forms, together with theory embedded in the supply and demand tradition. Thus, on the standards of interpretation which we have adopted in this introduction, Smith would be included as a theorist of both 'distinct and rival traditions in nineteenth century economic thought' (Dobb, 1973, p. 112).[14]

Third, the theory developed by neoclassical economists has been predominantly an equilibrium theory. Neoclassical theorists have defined equilibrium in various ways, but essentially what is involved in all cases is the notion that an equilibrium involves a consistency of all agents' plans. This consistency allows all planned actions to be conducted simultaneously. An important special case of this condition is one where supply and demand on each market are equal.

Although Ricardian and Marxian political economy is also predominantly based upon equilibria, the concept of equilibrium differs from that of the neoclassical school. Instead of a consistency of plans, or the equality of supplies and demands, it is a uniformity principle which is the defining quality. Equilibrium is conceived as a state of affairs in which both wages and rates of profit in each production activity are uniform and, furthermore, where the vector of spot prices is the same at the date when inputs are applied as it is at the date when outputs occur.

This conception of equilibrium has in fact been widely adopted in neoclassical economics. It is, for example, that type of equilibrium which Austrian capital theorists (e.g. Böhm-Bawerk, 1888), the theorists of capital productivity (e.g. Clark, 1899) and early Walrasian theory (e.g. Walras, 1874) invariably utilised, though of course in all cases it was utilised within a framework of supply and demand analysis. However, in the twentieth century it was increasingly realised

by neoclassical economists that to constrain prices by the uniformity principle was incompatible with a full generalisation of supply and demand theory. As a consequence there has been a move, led by Hayek (1941), Lindahl (1939), Hicks (1939) and Debreu (1959), toward the development of a theory of intertemporal equilibrium which jettisons the uniformity principle as applied to prices (see Milgate, 1979). John Eatwell, in his essay in this volume (Chapter 6), argues that this development has itself generated a concept of competition that is very different from that used in Classical political economy and totally divorced from the phenomena that neoclassical theory purports to explain. Issues related to these different conceptions of equilibrium are also discussed in the essay by Ian Bradley and Michael Howard (Chapter 7), and underlie the controversies referred to in G. C. Harcourt's paper (Chapter 8).

4 THE RICARDIAN THEORY OF VALUE AND DISTRIBUTION

In this section we outline Ricardo's theory of value and distribution. The treatment is largely expository, and criticisms that can validly be made are dealt with only in so far as they aid the exposition. Important defects in Ricardo's analysis are, however, discussed in section 6 of this introduction, as well as in the essay by J. E. King (Chapter 4).

THE PROBLEMS CONSIDERED BY RICARDO

Ricardo's central problem was to explain changes in class incomes over time.[15] It was central because Ricardo was concerned with the determinants of growth. In his view growth resulted predominantly from capital accumulation. Technical progress was not emphasised (Schumpeter, 1954, pp. 585–6). Accumulation was considered a function of the economic surplus.[16] It therefore became necessary to explain the size and composition of the surplus. The two elements of the surplus, rent and profit, were not of equal significance. Ricardo

assumed that landlords' saving was negligible. The determinants of profit thus become crucial. Moreover, within this framework, the rate of profit is of special significance. The savings propensity of the capitalists was assumed to be a stable function of the rate of profit. Thus, given a rate of profit, the rate of accumulation is determined.[17]

The main proposition of Ricardo's analysis is easily summarised. Assuming that wages are kept at subsistence by the Malthusian population mechanism, that agricultural production is subject to diminishing returns and is a component of the subsistence wage, that there is competition and that accumulation is a function of the rate of profit, then agricultural productivity will decline over time and lead to a decline in the rate of profit. The decline in agricultural productivity causes agricultural goods to rise in price relative to manufactures. The cost of the subsistence wage bundle of commodities also rises in terms of manufactures and this reduces profit per unit of capital throughout the economy. This causes the economy to approach a stationary state where the level of the rate of profit (r) is such that no further impetus to accumulation exists and the economy merely reproduces itself without changing scale.[18] The greater part of Ricardo's theoretical work was an attempt to put these ideas into a consistent logical system.

His purpose was not solely analytic. The analysis was devised in order to attack those institutions which hampered the rising bourgeois class in its activity of accumulation. More particularly, the purpose was to demonstrate the inexpediency of the restrictions on the importation of agricultural commodities which then prevailed. In Ricardo's view, these restrictions could only hasten the onset of the stationary state. But, as the political issues dimmed, the theory increasingly became of significance in itself and the polemical motivations, which caused him to begin his investigations, withered away.

ASPECTS OF RICARDO'S METHOD

Ricardo's problem is one of historical development. However, he often tackled the problem in other terms. The over-all model is decomposed into subsets of relations which are then

examined while holding other variables constant. This 'one at a time' method is particularly significant in the theory of profit and value. Thus, in studying the determinants of prices and the relation of wages, prices and profits, he holds outputs constant.[19] Furthermore, he ignores rent. Rents are conceived as intra-marginal surpluses, determined once outputs are fixed, so they play no role in the determination of prices or in the relation between the wage and profits.[20] Consequently Ricardo gets 'rid of rent' in order to concentrate on the relations between the wage, prices and profits.[21] Moreover, the wage, prices and profits which Ricardo analyses are those associated with equilibrium. All are assumed uniform over time and between sectors.[22]

These methods were used by Ricardo to assist in obtaining definite results. As such they have been both praised and condemned. For example, Blaug (1978, pp. 140–1) writes, 'His gift for heroic abstractions produced one of the most impressive models, judged by its scope and practical import, in the entire history of economic theory.' On the other hand, Schumpeter (1954, pp. 472–3) has written:

> The comprehensive vision of the universal interdependence of all the elements of an economic system that haunted Thunen probably never cost Ricardo as much as an hour's sleep. His interest was in the clear-cut result of direct practical significance. In order to get this he cut the general system to pieces, bundled up as large parts of it as possible, and then put them into cold storage . . . in the end, the desired results emerged almost as tautologies . . . The habit of applying results of this character to the solution of practical problems we shall call the Ricardian vice.[23]

THE ARGUMENT OF THE 'ESSAY'[24]

In order to support his theory Ricardo believed he needed to establish an inverse relation between the *numéraire* wage and the rate of profit. Accumulation, with diminishing returns operative in agriculture, would not alter the equilibrium level of the subsistence commodity bundle which workers could

purchase, but it would, in his view, lead to a rise in the *numéraire* wage. This would be the transmission mechanism by which diminishing returns reduced the rate of profit. However, Sraffa (1951, pp. xxxi–xxxii) argues that initially Ricardo dealt with the relation of diminishing returns and the rate of profit in a simplified context which precluded the need for valuation and allowed the relation to be formulated in product terms:

> At first, both in the *Essay* and in Ricardo's letters of 1814 and early 1815, a basic principle had been that 'it is the profits of the farmer that regulate the profits of all other trades'. The rational foundation of . . . [this] . . . principle . . . is that in agriculture the same commodity, namely corn, forms both the capital (conceived as composed of the subsistence necessary for workers) and the product; so that the determination of profit by the difference between total product and capital advanced, and also the determination of the ratio of this profit to the capital, is done directly between quantities of corn without any question of valuation. It is obvious that only one trade can be in the special position of not employing the products of the other trades while all the others must employ *its* product as capital. It follows that if there is to be a uniform rate of profit in all trades it is the exchangeable values of the products of *other* trades relative to their own capitals (i.e. relatively to corn) that must be adjusted so as to yield the same rate of profit as has been established in the growing of corn, since in the latter no value changes can alter the ratio of product to capital, both consisting of the same commodity . . . The advantage of Ricardo's method of approach is that, at the cost of considerable simplification, it makes possible an understanding of how the rate of profit is determined without the need of a method for reducing to a common standard a heterogeneous collection of commodities.

Sraffa's attribution to Ricardo of a 'corn theory of profit' was anticipated by Dmitriev (1898) and has been widely accepted. However, it has been forcefully argued by Hollander (1973, 1975) that the textual evidence is not sufficient to

justify it.[25] The merit of the Sraffa interpretation, however, is that it makes *sense* of Ricardo in a way that Hollander does not. It may be that such a sense is an imposed one, but for the purpose of evaluation we shall follow Marshall's advice (1890, appendix 1) and generously interpret Ricardo by accepting Sraffa's argument.

Ricardo went on in the *Principles* to attempt to generalise this argument, but it is opportune to note here that in doing so he remained within the confines of a model which distinguished between wage goods and non-wage goods, i.e. between goods which directly, or indirectly, enter the wage and those which do not. He believed that the rate of profit was exclusively determined by the conditions of production in wage-goods industries. The conditions of production in industries producing 'luxuries' are irrelevant.[26]

The need to generalise his theory was undoubtedly felt to be more acute because of the criticism made by Malthus:

> In no case of production, is the product exactly of the same nature as the capital advanced. Consequently we can never properly refer to a material rate of product . . . It is not the particular profits or rate of produce upon the land which determines the general rate of profits of stock.[27]

Moreover, Malthus argues, by implication, that Ricardo's position could not be validated in a general framework. In Malthus's own *Principles* he maintained that

> profits depend upon the prices of commodities, and upon the cause that determines these prices, namely the supply compared to the demand . . . [Ricardo's] . . . theory of profits depends entirely upon the circumstances of the mass of commodities remaining at the same price . . . We can infer nothing respecting the rate of profits from a rise in money wages, if commodities, instead of remaining at the same price are variously affected.[28]

Malthus did accept that the rate of profit declined with capital accumulation but believed that the operative mechanism was very different from that described by Ricardo. The rate of

profit fell, in Malthus's view, because of an excess of capital in relation to aggregate demand: 'All will in my opinion depend on the state of capital compared with the demand for it. This will be the prime mover, and it is this which will determine the profits which a capital employed in agriculture shall yield.'[29]

Ricardo yielded nothing substantial to Malthus. He adhered throughout to the view that profit arose from the conditions of production and that the forces of supply and demand played a subsidiary role of distributing this profit according to the requirements of a uniform rate on capital. What Malthus's arguments did, however, was to bring home to Ricardo the need for a generalisation and to lead him to believe that his arguments were contrary to those of 'supply and demand' theory and that, as such, the latter was deficient.[30]

THE ARGUMENT OF THE 'PRINCIPLES'

In the light of the above it is not surprising that Ricardo believed that a generalisation of his argument required a theory of value by which he could determine the effect which a rise in the *numéraire* wage would have on prices and, through these, on the rate of profit.[31] He begins by adopting a labour theory of value where the ratio of the equilibrium prices of any two commodities will equal the ratio of their embodied labour coefficients. The point which Ricardo stresses is that Smith, and his followers in the tradition of supply and demand, had rejected the labour theory for erroneous reasons and that the theory is of more general applicability than they had believed.

Smith (1776, p. 53) maintained that the labour theory of value held only in 'early and rude' society which 'precedes both the accumulation of stock and the appropriation of land'. However, as soon as private property in the means of production develops, it ceases to be a valid principle governing relative values. In effect, Smith argues that the very existence of property incomes invalidates the labour theory. In this context he develops an 'adding-up' theory of value where the equilibrium price of a commodity equals the sum of the remuneration paid to the factors that produced it, i.e. wages, rent and profit (Smith, 1776, pp. 54–5).

Ricardo attempted to show that, provided that the different forms of capital were used in the same proportions in all productive processes, the existence of profit, when allocated on the basis of a uniform rate, was not incompatible with the labour theory. Moreover, the existence of rent, whatever the circumstances, did not contradict the theory because rent was price-determined, not price-determining.[32]

In defending the labour theory of value in this way Ricardo explicitly recognized its limitations. Where the 'constitutions of capital' were different between industries, the competitive requirement of a uniform rate of profit ensured that relative equilibrium prices no longer exactly equalled embodied labour ratios.[33] However, he argued that the deviations were unimportant and that although the labour theory was not analytically correct, nevertheless it gave a sufficiently good approximation for his purpose.[34]

On this basis, Ricardo provided a generalisation of his theory of profit. He did so by substituting embodied labour for corn as the unit in terms of which economic magnitudes were measured. Profit was now determined by the 'proportion of the annual labour . . . directed to the support of the labourers'.[35] Consequently the rate of profit would fall with diminishing returns because of the rising labour cost of corn, a necessary component of the subsistence wage bundle.

THE 'RICARDO EFFECT'

Ricardo never substantially improved upon this formulation of his theory. However, he did attempt to argue his position rather than simply assert it. These arguments are important in their own right and, moreover, form the basis of a problem, the solution of which evaded him during the rest of his life, i.e. the problem of determining an 'invariable standard of value'.

In his working out of the labour theory of value, Ricardo discovered what he termed the 'curious effect' of an increase in the *numéraire* wage and the corresponding decrease in the rate of profit.[36] Such a wage and rate of profit change, he argued, would, in industries which were sufficiently capital-intensive, cause prices to *fall*. In such a case the reduction in

profit costs would more than compensate for the increase in wage costs.

Although this implied that the labour theory did not strictly hold,[37] Ricardo, rather than regarding it as weakening his attempt to generalise his profit theory, took it as a phenomenon in his favour. The reason for this is clear. Malthus had argued, in his opposition to Ricardo, that 'supply and demand' would operate to increase all prices, if the wage rate rose. This proposition was initially put forward by Smith and represented a deduction from his 'adding-up' theory of value. Ricardo's examples indicated, by contrast, that prices would fall. In fact, Ricardo was more explicit. In the first edition of the *Principles* of 1817 he wrote that 'it appears . . . that no commodities whatever are raised in absolute price, merely because wages rise; that they never rise unless additional labour is bestowed on them; but that all commodities in the production of which fixed capital enters, not only do not rise in wages, but absolutely fall'.[38]

Ricardo's presentation was, however, contrived. The fact that no price rose, and those of commodities using fixed capital fell, resulted only because his *numéraire* commodity was produced under conditions of 'unassisted labour' which represented the lowest 'constitution of capital'. Malthus pointed this out,[39] and in the third edition of his *Principles* of 1821 Ricardo responded by choosing as *numéraire* that commodity which has an 'average constitution of capital'.[40] His examples were then formulated to show that, when *numéraire* wages rose and there was a decline in the rate of profit, those commodities with a 'constitution' above average fell in price and those with a below-average 'constitution' rose in price. In the former case the increase in wage costs was more than compensated by a decline in profit costs, and the reverse occurred in the latter. He still regarded this as supporting his theory, for the critics' arguments remained faulty.[41]

The argument which he used directly to support or generalise his own theory remained that stated at the end of the last section. Ricardo maintained that the modifications required to be made to the labour theory of value on account of unequal 'constitutions of capital' were secondary. On this basis he considered that his theory was generally valid.

AN 'INVARIABLE STANDARD OF VALUE'

Ricardo's problem of finding an 'invariable standard' is really a set of problems, and they are best kept distinct, though they do not appear as such in his work.[42]

(1) The concept arises in the problem of finding, whenever there is a change in the exchange rate of two commodities, in which commodity there has occurred a change in *real* or *absolute* value. Thus, Ricardo writes:

> When commodities varied in relative value, it would be desirable to have the means of ascertaining which of them fell and which rose in real value, and this could be effected only by comparing them one after another with some invariable measure of value, which should itself be subject to none of the fluctuations to which other commodities are exposed.[43]

In general such a statement makes no sense because value is a relative concept. However, in a context where the labour theory of value holds, it is meaningful to talk in terms of *real* or *absolute* value. With each commodity can be associated a number, equal to its embodied labour, which can be defined as its absolute or real value. A change in the exchange ratio (relative value) of two commodities can then be regarded as the result of a change that has occurred in *absolute* or *real* values. Ricardo maintained that a commodity whose production conditions never changed would, in such a context, provide an appropriate *numéraire* which would show changes in absolute values. A variation in the exchange rate between it and another commodity would mean that the absolute value of the other commodity had changed.[44]

(2) Ricardo, however, continued to conceive of the above problem as a meaningful one outside the context of the labour theory of value. In other words, he believed that a concept of absolute or real value made sense even when embodied labour ratios no longer equalled relative prices so that the term 'value' could no longer refer to both embodied labour and equilibrium price. He failed to specify, or even to conceptualise, the conditions which an invariable standard would have to meet in

these circumstances. He did, however, maintain that the commodity which was produced with an average constitution of capital provided the best approximation.[45]

(3) In his last paper on 'Absolute value and exchangeable value'[46] there is a reformulation of the problem. Essentially what Ricardo does is to merge the two concepts dealt with above. He writes, 'I may be asked what I mean by the word value, and by what criterion I would judge whether a commodity had or had not changed its value. I answer, I know of no other criterion of a thing being dear or cheap but by the sacrifices of labour made to obtain it.'[47] On this basis he sought a *numéraire* which would reflect only changes in embodied labour quantities, even when constitutions of capital were not the same. In other words, prices measured in such a *numéraire* would not change unless the embodied labour involved in their production changed. This concept of the invariable standard 'would act as a sort of sieve, allowing through the mesh the effects produced by a change in wages and retaining only those produced by a change in the quantity of embodied labour'. (Meek, 1956, p. 112).[48]

(4) The above problem does not explicitly appear in the *Principles*, though it may indeed help to understand what Ricardo meant on certain matters.[49] However, according to Sraffa, an analogous problem is tackled. In the course of his investigations into distribution, Ricardo

was troubled by the fact that the size of . . . [the national product] . . . appears to change when the division changes. Even though nothing has occurred to change the magnitude of the aggregate, there may be *apparent* changes due solely to change in measurement, owing to the fact that measurement is in terms of value and relative values have been altered as a result of a change in the division between wage and profits . . . Thus the problem of value which interested Ricardo was how to find a measure of value which would be invariant to changes in the division of the product; for, if a rise or fall of wages by itself brought about a change in the magnitude of the social product, it would be hard to determine accurately the effect of profits. (Sraffa, 1951, p. xlviii.)

Each of these problems can be understood *in terms of Ricardo's approach to the generalisation of the theory*. He believed that a successful generalisation depended on the formulation of a theory of value. All his problems with an 'invariable standard' can be seen as attempts to show that the complexities of a genuine multi-sector economy could not be appealed to in order to support a cause contrary to his own. In short, Ricardo believed that in all cases there were definite relationships between diminishing returns, changes in prices, changes in the wage and in the rate of profit and that, as a consequence, it must be possible to choose a *numéraire*, or set of *numéraires*, which would clearly reveal these relationships.

5 THE MARXIAN THEORY OF VALUE, EXPLOITATION AND PROFIT

The Marxian theory of value, exploitation and profit is a refinement of Ricardian ideas. Indeed, Schumpeter designates Marx as 'Ricardo's only great follower' in this area.[50] He was, however, a critical follower and used Ricardian analysis for his own distinctive purposes. He considered Ricardo's work to be flawed in both method and substantive propositions, believing the root of this to lie in Ricardo's failure to specify a conceptual structure allowing a precise linking of labour values, equilibrium prices and profit.[51] Consequently Marx sought to fill this vacuum in Ricardian theory and thereby provide a secure foundation in labour values for the theory of equilibrium prices, capital and profits.[52] He did so by providing a theory of exploitation through which he attempted to show that equilibrium prices were the 'phenomenal form' of labour value and profit the 'phenomenal form' of exploited labour.[53]

The Marxian theory is, however, more than Marx's theory. Although Marxism after Marx has been sterile in this area, significant contributions have been made by others, for example by Bortkiewicz (1907) and Seton (1957). This section will provide an exposition of the Marxian theory interpreted to include this work. Nevertheless, it will be predominantly

expositional rather than critical. Certain criticisms are con-
sidered in section 6 and the debates on the logical structure
of Marxian theory form the subject-matter of Mark Blaug's
and J. E. King's essays (Chapter 5 and 4 respectively). The
papers by G. C. Harcourt and Ian Steedman (Chapters 8 and
3 respectively) also deal with the validity of Marxian proposi-
tions.

THE THEORY OF EXPLOITATION

In contrast to Ricardo, Marx explicitly defined the value of a
commodity as its embodied labour content. More precisely,
Marx (1867, pp. 39, 107, 197) defined the value of a com-
modity as the amount of 'abstract socially necessary labour
that it contains'. This involves no more than a spelling out of
assumptions which Ricardo took for granted in defining the
unit of embodied labour. 'Abstract' labour is the unit to which
heterogeneous types of labour are 'reduced' to allow aggrega-
tion. The procedures involved in defining this concept, together
with the difficulties to which they give rise, are dealt with by
Mark Blaug (Chapter 5). The term 'socially necessary' refers
to the amount of abstract labour which is embodied in a
commodity when it is produced in a quantity, and by a
method of production, consistent with equilibrium. In this
section we deal with Marxian theory under the assumption
that all labour is homogeneous and we consider only equilibria.
Consequently any difficulties involved in the notion of
'abstract socially necessary labour' are circumvented.[54]
    The concept of equilibrium price is considered to be an
analytically distinct category from value. Marx attempts to
show how equilibrium price can only be understood in terms
of value, but there is no equivalence of definition.
    Furthermore, and again unlike Ricardo, Marx decomposes
the labour value of a commodity into three component parts:
(1) The value of the physical means of production 'used up'
    in its production. This is called *constant capital* and is
    symbolised by *c*.
(2) The value which corresponds to the value of the workers'

'labour power'. This is called *variable capital* and is symbolised by v.[55]

(3) The value created by workers over and above the replacement of the value of their labour power. This is called *surplus value* and is symbolised by s.

The value of any commodity, i, can therefore be written as $c_i + v_i + s_i$. Whenever surplus value is positive there is exploitation, and Marx considered this to be a property inherent in the equilibrium of a competitive capitalist economy. He argued that such an equilibrium would be characterised by sufficient unemployment of labour to ensure that the equilibrium wage lay at the subsistence level.[56] The value of labour power is therefore equal to the value of the subsistence wage bundle. It is also assumed that technology is such as feasibly to allow a higher wage rate. Marx deduces from this that surplus value and the rate of surplus value, s/v, will be positive, as labour inputs are required in all production and the subsistence wage is non-zero.[57]

In the case where the labour theory of value holds, profit in each process would be equal to the surplus value created in that process, assuming prices to be measured in labour units. However, Marx was perfectly aware that equilibrium price ratios will equal ratios of corresponding labour values only under special conditions. Nevertheless, throughout *Capital*, until part 2 of volume III, Marx assumes that the labour theory of value does hold. He does so for three reasons:

(1) He wanted to show that the existence of exploitation and profit is consistent with all commodities selling at their labour values. Marx believed that such a demonstration was important, for it located the source of profit within productive activity and undermined theories based upon 'unequal exchanges'.[58] In terms of the structure of Marx's argument, provided that all commodities are produced under conditions of equal 'organic compositions of capital' (i.e. equal c_i/v_is), the labour theory of value holds and is compatible with the existence of an equal rate of exploitation and uniform rate of profit.[59] The rate of profit would equal

$$\sum_i s_i \Big/ \sum_i (c_i + v_i)$$

(2) Marx considered that 'commodity production' and capitalist commodity production[60] initially develop under conditions which ensure that relative prices equal corresponding ratios of labour values. Competitive relations and rational acquisitive behaviour, which together produce an equal rate of profit in all activities, develop historically, and initially labour values determine prices directly quite independently of sectoral organic compositions of capital.[61]

(3) In part 2 of volume III of *Capital* Marx attempted to prove that even with a fully developed capitalist system, involving an equal rate of profit and different organic compositions of capital, the consequent departure of relative equilibrium prices from ratios of labour values was essentially a matter of secondary relevance. In particular, the propositions which hold under the labour theory of value regarding the determination of aggregate profit by aggregate surplus value and the equality of the rate of profit with

$$\sum_i s_i / \sum_i (c_i + v_i)$$

remain valid. It is to the consideration of this third point that we now turn.

THE TRANSFORMATION OF VALUE INTO PRICES OF PRODUCTION AND SURPLUS VALUE INTO PROFIT[62]

Marx's transformation algorithm is simple and, as has been known since the turn of the century, too simple. Assuming the economy is composed of three departments or sectors, and that capital is purely circulating capital, then the value system can be represented as follows:

Department I $c_1 + v_1 + s_1 = v_1^*$

Department II $c_2 + v_2 + s_2 = v_2^*$

Department III $c_3 + v_3 + s_3 = v_3^*$

v_i^* $(i = 1, \ldots, 3)$ represents outputs measured in value.[63] The relation between v_i^* and the output of department i evaluated in prices of production, $v_i^* p_i^*$, where p_i^* is the price/

value ratio applicable to department i, and the relation between surplus value and profit, are represented by the following equations:[64]

Department I $\quad (c_1 + v_1)\,(1 + r) = v_1^* p_1^*$

Department II $\quad (c_2 + v_2)\,(1 + r) = v_2^* p_2^*$

Department III $\quad (c_3 + v_3)\,(1 + r) = v_3^* p_3^*$

$$r = \sum_i s_i / \sum_i (c_i + v_i)$$

It follows that aggregate surplus value necessarily equals aggregate profits, and aggregate output measured in values equals aggregate output measured in prices of production. Value magnitudes therefore determine price and profit magnitudes in the aggregate. Furthermore, prices of production deviate from values in a systematic fashion. The department with an average organic composition of capital would have a price/value ratio equal to unity. A department with above-average composition would have a price of production higher than its unit labour value, and conversely for a below-average department. Consequently all that is involved in the transformation is a *redistribution* of surplus value. But it is this, according to Marx (1894, pp. 167–8), which explains the deceptive 'appearances' created by capitalist relations of production and the development of erroneous, 'vulgar' theories attributing profit to the productivity of capital.

The labour theory of value is therefore, on Marx's argument, essential to the scientific understanding of profit and prices: 'If one did not take the definition of value as the basis, the *average profit*, and therefore also the [prices of production], would be purely imaginary and untenable. Without . . . [the determination of value by labour] . . . the average profit is an average *of nothing*, pure fancy' (Marx, 1862b, p. 190). In Meek's words, surplus value provides a 'prior concrete magnitude' determining profit, 'a magnitude independent of market prices which could plausibly be regarded as constituting the ultimate source of profit' (Meek, 1977, p. 126).[65]

Despite these strong claims, however, Marx realised that

his transformation algorithm was faulty. It did not correctly represent the price and profit structure of an equilibrium. If the economy is technologically interconnected, as Marx assumes,[66] capital inputs have also to be transformed into price magnitudes. The relevant capital magnitudes on which profit is calculated are not labour-value magnitudes but magnitudes evaluated in equilibrium prices. Marx (1894, p. 161) realised this but never formulated a transformation algorithm that incorporated it. As a consequence a problem was posed.

The first acceptable solutions of the problem were proposed by Dmitriev (1898) and Bortkiewicz (1907). Bortkiewicz was, historically speaking, the most influential.[67] He assumed that Department I produced constant capital, Department II produced wage goods and Department III produced luxuries. In addition he assumed stationary conditions.[68] On this basis he represented the procedure for transformation in the following equations:

$$(c_1 p_1^* + v_1 p_2^*)(1 + r) = v_1^* p_1^*$$

$$(c_2 p_1^* + v_2 p_2^*)(1 + r) = v_2^* p_2^*$$

$$(c_3 p_1^* + v_3 p_2^*)(1 + r) = v_3^* p_3^*$$

$$p_3^* = 1$$

The last equation represents a condition specifying the *numéraire*. It defines the unit of measurement for prices in terms of labour values. Such an assumption is what Seton (1957) later called an 'invariance postulate' linking the units of measurement for prices to the value system.[69] Bortkiewicz solved these equations to show that p_1^*, p_2^* and r could be represented as functions of the labour-value data.[70]

However, certain problems are implicit in the Bortkiewicz algorithm. In general it will not be true that

$$r = \sum_i s_i / \sum_i (c_i + v_i)$$

or that

$$\sum_i v_i^* = \sum_i v_i^* p_i^*$$

though, given stationary conditions

$$\sum_i s_i = r \sum_i (c_i p_1^* + v_i p_2^*)^{71}$$

Marx, however, had stated that all these conditions would hold and, more importantly, in developing his theory of the 'laws of motion' had assumed them to hold. So far as the internal coherence of the Marxian theory of profit was concerned, therefore, Bortkiewicz's 'solution' proved something of a mixed blessing and much debate has been generated as a consequence.

A typical reaction was that of Winternitz (1948),[72] who asserted that what was of importance was the equality

$$\sum_i v_i^* = \sum_i v_i^* p_i^*.$$

This, it was maintained, was 'the obvious proposition in the spirit of the Marxian system' (Winternitz, 1948, p. 279). Consequently the fourth equation of the Bortkiewicz algorithm was deleted and replaced by this condition. This also made the assumption of stationary conditions redundant and it was dispensed with, thus apparently allowing greater generality. Outside special cases neither

$$r = \sum_i s_i / \sum_i (c_i + v_i)$$

nor

$$\sum_i s_i = r \sum_i (c_i p_i^* + v_i p_2^*)$$

will hold in the reformulated transformation procedure, but this was not commented upon by Winternitz. Therefore, all that had really been accomplished was a redefinition of the *numéraire* without specification of why the change was of significance.

The Bortkiewicz–Winternitz method of transformation was generalised by Seton (1957) for 'the most general n fold subdivision of the economy, in which each product may be distributed among *several* or *all* possible uses' (Seton, 1957,

p. 163). It was concluded that 'the internal consistency ' of the procedure is 'fully vindicated' (Seton, 1957, p. 176) subject to one reservation:

> No doubt the . . . [invariance postulates so far considered] . . . do not exhaust all the possibilities. There may be other aggregates or relationships with perfectly reasonable claims to invariance whose candidacy has not so far been pressed. But . . . *the principle of equal profitability in conjunction with any one invariance postulate will completely determine all prices* . . . and thereby solve the transformation problem. However, there does not seem to be an objective basis for choosing any particular invariance postulate in preference to all the others, and to that extent the transformation problem may be said to fall short of complete determinacy. (Seton, 1957, p. 167.)

Debate has continued as to what is of importance.[73] The debate has no analytic significance, for it is no more than a debate concerning the choice of *numéraire*.[74] What is of central importance for Marx is that the source of profit is surplus value. This can be shown to be valid quite independently of price normalisation, for it has been proved by Morishima and others (Morishima and Catephores, 1978, p. 30) that, *for the cases discussed in this section,* positive surplus value (or a positive rate of surplus value) is a necessary and sufficient condition for the existence of positive profits (or a positive rate of profit). This result is appropriately called the Fundamental Marxian Theorem (Morishima, 1973, p. 6). It is an exceedingly powerful result, for it involves both sufficiency and necessity. Consequently, within its frame of reference, *any* representation of a capitalist economy involving positive profits, whether stated in labour-value terms or not, can be shown to involve exploitation.

THE DEVELOPMENT OF CAPITALISM

Marx analyses the historical development of capitalist in terms of labour values. In particular, he attempts to establish two 'laws of motion', the tendency for the profit rate to fall and

the tendency for the unemployment of labour to rise. Both hinge on his theory of technical change under capitalism. He considered innovation to involve a labour-saving bias which would be reflected in a rise in the over-all organic composition of capital. This, he believed, would lead to the creation of a 'reserve army of unemployed' of sufficient magnitude to keep wages at subsistence level. It would also lead to a fall in the rate of profit. Marx argued that this rise in the organic composition would not be sufficiently compensated by a rise in the rate of exploitation. Consequently, the rate of profit, given by

$$\sum_i s_i / \sum_i (c_i + v_i) = e/(k + 1)$$

(where e represents the rate of surplus value and k is the over-all organic composition) would fall. Although Marx also develops a theory of effective demand and cyclical crises, both his dynamic theory of the profit rate and his theory of unemployment are formulated independently of these factors. (Shigeto Tsuru's essay (Chapter 9) shows how Marx's writings on the development of capitalism can provide fresh insight into contemporary problems.)

MARX'S METHOD

Marx devoted considerable attention to methodological matters and in several significant ways the procedures he adopted were novel. However, the essential method involved in the issues discussed above is Ricardian. It is the method of equilibrium analysis, assuming outputs are fixed, and the comparison of equilibria. Values are transformed not into market prices but into equilibrium prices, defined in terms of cost of production based on uniform wages and a uniform rate of profit (Meek, 1967, p. 145). The theory of the declining rate of profit and the theory of unemployment in no way appeal to matters involving disequilibrium states. Labour values are themselves defined in terms of equilibria since they are measured in 'socially necessary' units. In addition, Marx uses a formula for the rate of profit which he believes is valid for an equilibrium and recognises that it would not be valid outside

such an equilibrium (Shoul, 1967). Consequently, this dynamic theory is based upon the description of an economy in equilibrium.

6   THE SRAFFA-BASED REVIVAL OF CLASSICAL AND MARXIAN POLITICAL ECONOMY

Classical and Marxian political economy contain major defects. Most obvious are the 'laws' of capitalist development which these schools enunciated. Neither the dynamics of population growth nor technical change has resulted in keeping wage rates close to subsistence. Capitalist economies have not tended to a stationary state, nor have the contradictions of development involved growing unemployment. For those economists who have subsequently worked in this tradition of economic analysis, however, these matters have been considered to be of secondary relevance. What have been considered important are the problems dealt with by these schools and especially the type of analysis utilised. In other words, the affiliation to Classical and Marxian political economy has been based not so much on *what* was argued but on *how* it was argued. Nevertheless, even this is a delicate matter, for there are important analytical limitations in Classical and Marxian political economy.

Most significant in this respect are the problems associated with the labour theory of value. Smith, Ricardo and Marx all recognised that ratios of equilibrium prices would not in general equal the corresponding ratios of embodied labour coefficients. Nevertheless, all three carried out analysis in terms of labour values. Economic magnitudes were defined, measured and aggregated through labour values, and explanation was frequently cast in the same terms. It follows that a necessary requirement underlying their analysis is that labour values be well-defined entities whose utilisation produces economically sensible results. These requirements cannot always be met for the reasons discussed by Mark Blaug and J. E. King (Chapters 5 and 4 respectively). Blaug concentrates on the difficulties which arise in any attempt to reduce different types of labour to homogeneous units in terms of which

labour values can be defined. King deals, *inter alia*, with the difficulties that can arise when there are multiple processes of production and commodities are jointly produced. These can result in labour values becoming ill-defined or of perverse sign, thus leading to nonsensical results.

These problems are by no means tangential to the analytical structure of Classical and Marxian political economy and it is in their terms that we can view the significance of Sraffa's *Production of Commodities by Means of Commodities* (1960). An outline of the models constructed by Sraffa, together with some of the principal results, is provided by Ian Bradley and Michael Howard (Chapter 7). Here it will suffice to note that these models are constructed on the same principles that governed those of Classical and Marxian political economy, but they are immune from the analytical limitations which we have just discussed. Sraffa's work is orientated towards studying the surplus arising in capitalist production. The framework is specified in terms of a class system and is formulated independently of the principles of supply and demand theory. The same structure of determination is present, as is the same concept of equilibrium. However, the concept of labour value plays no role in the construction of the theory. As a consequence, Sraffa's work is free of the limitations associated with the use of this concept. Moreover, Sraffa's analysis indicates that many of the propositions of Classical and Marxian political economy can be rigorously proved and generalised outside the confines in which they were initially formulated. As a consequence it has led, in Meek's words (1967, p. 161), to a 'rehabilitation' of these schools of thought. The significance of this is discussed both by G. C. Harcourt (Chapter 8), and Bradley and Howard.

The importance of Sraffa's work is, however, wider than this. In addition to reformulating Classical and Marxian analysis it provided the basis on which significant defects of supply and demand theory could be exposed. The most notable of these formed the subject-matter of the capital controversies in recent years.[75] These proved conclusively that the arguments of the neoclassical productivity theorists were logically defective outside very special cases. Adherents to a Sraffa-based economics, however, have argued that it exposes logical

flaws in *all* forms of supply and demand theory.[76] Naturally, this is a hotly disputed issue.[77]

Sraffa's work is also of great relevance for the history of economic thought. This is indicated in Ian Steedman's essay (Chapter 3). He shows, through the utilisation of Sraffa's framework, that on certain issues Ricardo's analysis was superior to that of Marx and that as a consequence Marx's evaluation of Ricardo was sometimes erroneous. More generally, Sraffa's 'rehabilitation' of the Classical—Marxian approach to economic theory, and the associated critique of the supply and demand tradition, must lead to an over-all reconsideration of the analytical progress that has occurred. Meek's work in the history of economic thought sought to accomplish just this. It thereby exemplified what is best in this field of enquiry – the assessment of history in terms of the present with the aim of achieving a more informed understanding of modern theory.

NOTES TO THE INTRODUCTION

1. Most historians of economic thought have not explicitly spelt out their standards of judgement. Generally speaking, however, the best works in the field, like Schumpeter (1954), Dobb (1937; 1973), Meek (1967; 1977), Blaug (1978) and Morishima (1973; 1977), have done so.
2. For example, Smith's work is regarded as representing a stage in the development of both traditions. Ricardo, a key figure in the development of the surplus approach, greatly influenced neoclassical theory, particularly its Austrian version. More recently, the work of Von Neumann and Leontief has been utilised by theorists in both traditions.
3. Making such a distinction empirically operational bristles with difficulties. However, for the economists we are discussing, these were greatly reduced because it was generally assumed that, in equilibrium, workers received a wage no greater than subsistence requirements.
4. 'Let us . . . observe that it is really not so very odd to look upon an economy as an engine that is fed materials drawn from the womb of nature and that simply works up these materials without adding to them: the only question that arises is whether or not the analogy is useful' (Schumpeter, 1954, pp. 237–8).

5. More accurately, there were three value forms which the surplus took: rents, taxes and tithes. However, it was the general practice to abstract from the latter two. Schumpeter (1954, p. 238) says concerning the Physiocrats' theory: 'In general conception this theory bears a striking similarity to that of Marx. Exactly as Quesnay let land alone be productive of surplus value, so Marx let labour alone be productive of surplus value . . . So far Marx's theory looks as if it were the result of switching Quesnay's schema from one of Petty's two original factors of production to the other. There seems, however, to be a fundamental difference between the two . . . [For Marx] . . . labour's productivity is from the first a value productivity and he attempted to show . . . how surplus value emerges from the mechanism of competitive markets. Quesnay made no such attempt . . . He took it for granted that the fact of physical productivity implied value productivity, and he shifted in midstream from the one to the other.'

6. Marx (1862a, p. 344) said of the *Tableau* that it was 'incontestably the most brilliant . . . [conception] . . . for which political economy had up to then been responsible'. His own reproduction models were heavily influenced by the *Tableau*. These 'directly inspired the Soviet method of balances in the 1920s, and as we now know the basic idea of the more complex input–output matrix of Leontief was derived from these balances' (Dobb, 1967, p. 537).

7. Meek (1962, pp. 297–8) noted the basic contradiction of Physiocratic work on this matter: 'The Physiocrats stoutly maintained . . . that land rent was the *only* income in the nature of a surplus . . . Yet at the same time their theoretical system can properly be said to have been a "capitalist" system in the sense that its whole *raison d'être* was the advocacy of a state of affairs in which economic activity, particularly in agriculture, would be conducted by wealthy entrepreneurs motivated by a desire for profit.'

8. This new definition, which was also adhered to by Ricardo and Marx, involved a critique of the Physiocratic conception of the surplus. The latter reflected a notion of physical rather than value productivity, and Smith, Ricardo and Marx regarded the former as of limited use in the analysis of a capitalist economy. They therefore defined the surplus in value terms. Moreover, all three sought to show how the mechanisms of a capitalist economy would normally lead to the receipt of profit by capitalists and that this profit was genuinely 'disposable' rather than being the receipt of revenue to cover necessary reproduction costs. See, for example, Marx (1862a, pp. 50–2). The Physiocratic conception of the surplus did not, however, immediately cease to have adherents with the publication of the *Wealth of Nations*. There were great controversies as to

the appropriate conceptualisation of the surplus in subsequent years. On this, see Meek (1962, pp. 345—62). Criticism of the Physiocrats in terms of the framework of modern neoclassical economics would emphasise other matters. It can be easily constructed by answering three questions in neoclassical terms. (1) What distinguishes agriculture from other production activities? (2) What is a commodity? (3) Assuming we define certain activities as generating surplus in the same way as the Physiocrats did, what is the economic significance of this?

9. See also Meek (1976, pp. 164, 177, 219—29, 242—3).

10. See also Meek (1967, pp. 18—33). Meek also stressed that Smith's new conceptualisation was not that which appeared the obvious one to adopt. Smith 'possessed that peculiar faculty . . . of being able to discern in the world about him those features which although not preponderant now are destined to become so as the result of a process of social development' (Meek, 1962, p. 320).

11. On this matter see, for example, Meek (1977, pp. 149—75), Schumpeter (1954, pp. 543, 568) and Howard and King (1975, pp. 24—61). It is true that some neoclassical economists, like Walras, did not categorise agents simply as 'consumers' and 'producers' but instead adopted a class typology similar to that of Smith, Ricardo and Marx. However, no specific class behaviour was assumed. The terminology represented only names for different economic activities and carried no implications of different socially determined behaviour patterns. The degree to which the explicit sociological basis of the Classicals was articulated did vary, however. It is most explicit in the case of Marx and of least significance in the case of Ricardo. See, for example, Marx (1859, p. 60).

12. Ricardo (Works VIII, p. 279). See also Ricardo (Works I, pp. 382—5).

13. See, for example, Garegnani (1970), Eatwell (1976), Pasinetti (1977) and Roncaglia (1978).

14. See also Meek (1977, pp. 1—17, 149—64) and Schumpeter (1954, pp. 189—94, 648). Marx seems the first to have explicitly noted this aspect of Smith's work. See Marx (1862a, p. 165).

15. Ricardo (Works I, p. 5; Works VIII, pp. 78—9).

16. Ricardo assumes that the decision to save is also a decision to invest. See Garegnani (1978).

17. If capitalists are the only savers and their savings propensity (s_c) is a constant, then the rate of accumulation (I/K) necessarily equals $s_c r$ (where I is investment, K the capital stock and r the rate of profit).

18. Ricardo (Works I, pp. 120—1).

19. This is particularly true of chapter 1 in the *Principles* (Works I). See also Schumpeter (1954, pp. 483, 569, 652—4).

20. Ricardo (Works I, p. 77).
21. Sraffa (1951, p. xxiii) and Schumpeter (1954, pp. 569, 673, 675).
22. Ricardo was quite explicit on this. He wrote to Malthus that 'You always have in mind the immediate and temporary effects . . . [I] . . . fix my whole attention on the permanent state of things that will result from them.' See Schumpeter (1954, pp. 494–5, 562).
23. See also Schumpeter (1954, pp. 569, 668, 1171).
24. 'An essay on the influence of a low price of corn on the profits of stock, showing the inexpediency of restrictions on importation' (Works IV, pp. 9–41).
25. 'It follows from the argument of this paper that substantially the same position as that ultimately appearing in the *Principles* was maintained from the very outset, namely that variations in the money-wage rate, in consequence of changing prices of wage goods, will be accompanied by inverse movements in the general rate of profit' (Hollander, 1973, p. 260).
26. Ricardo (Works I, pp. 118, 132, 205).
27. Ricardo (Works VI, pp. 117–18).
28. Malthus (1820, pp. 326–34; quoted in Dobb, 1973, p. 74). Malthus, of course, was not Ricardo's only critic. West believed that the wage and rate of profit were positively related (see Stigler, 1952, p. 177). Other economists were, in general, not well disposed to accepting Ricardo's analysis. See Gordon (1959), Meek (1967, pp. 51–74) and Dobb (1973, pp. 96–136).
29. Ricardo (Works VI, p. 111). Malthus's position, like that of Ricardo, reflected an ideological commitment. In Malthus's case his opposition to Say's law reflected his attempt to reconcile the interests of the landlords and capitalists.
30. Ricardo (Works I, chs 4, 20, 30). See also Schumpeter (1954, pp. 600–1).
31. More specifically, Ricardo believed he required a theory of value applicable only to commodities 'which can be increased in quantity by the exertion of human industry, and on the production of which competition operates without restraint' (Works I, p. 12). By value Ricardo generally means equilibrium price (see Works I, p. 92). However, see pp. 19–21.
32. Ricardo (Works I, ch. 2).
33. Ricardo (Works I, ch. 1).
34. Ricardo (Works I, p. 36). See also Sraffa (1951, pp. xxxvii, xl) and Stigler (1958).
35. Ricardo (Works I, p. 49).
36. Ricardo (Works VII, p. 82).
37. The defect of the labour theory of value due to different constitutions of capital can be looked at in two different ways: 'First, that

of occasioning a *difference* in the relative values of two commodities
which are produced by equal quantities of labour. Second, that of
the effect which a change of wages has in producing a *change* in
their relative value' (Sraffa, 1951, p. xivii).

38. Ricardo (Works I, p. 63). The reason why Ricardo took the 'curious
effect' of a rise in wages to support his position is *clear* but not
valid. It is not valid, as he formulated it, because it does not logi-
cally bear upon the problem of the relation of the *numéraire* wage
and rate of profit. In his numerical examples dealing with this
matter he postulates an increase in the *numéraire* wage *and* a fall in
the profit rate rather than properly deducing the latter from the
former. Obviously any result derived from such a procedure is
irrelevant to his problem. It would appear that Ricardo was 'dis-
tracted' from his proper course by the criticisms of Malthus. In any
event, to undermine one's critics does not in itself justify one's
own argument. Malthus's method was no better, however. His main
point represented no more than an indication that a true multi-
sector analysis was more complex than that of the 'corn model',
and an assertion that this complexity undermined Ricardo's position.

39. Ricardo (Works II, pp. 62–4).

40. Ricardo (Works I, p. 45).

41. Within the terms of Ricardo's argument, to get the Smith–Malthus
result the *numéraire* would have to be that commodity with the
highest constitution of capital. We have already seen (above, n. 38)
that this analysis was logically irrelevant to a proper generalisation
of Ricardo's theory.

42. Again, an understanding of Ricardo can be aided by criticism. Both
Ricardo's own analysis concerning an invariable standard of value,
and that of many commentators on Ricardo, are generally stated in
terms which can only be described as gibberish. Indeed, the very
phrase 'invariable standard of value' is problematic. Modern econ-
omists think of value as relative value, i.e. value relative to some
numéraire. Once a *numéraire* is chosen and its price set equal to
unity it is necessarily invariable (by definition). In any framework
involving more than one commodity there are an infinite number
of 'invariable' standards, because there are an infinite number of
possible *numéraires*. However, Ricardo's analysis of the 'invariable
standard of value' was partly based on rational grounds. There were
meaningful problems he was struggling with, though interpenetrat-
ing with these were problems created by his own conceptual frame-
work and prejudices, rather than problems which were inherent in
the subject.

43. Ricardo (Works I, p. 43).

44. Ricardo (Works I, p. 54).
45. Ricardo (Works I, pp. 45—6).
46. Ricardo (Works IV, pp. 361—412).
47. Ricardo (Works IV, p. 397).
48. Meek argues that Ricardo took this line because he came to identify 'labour embodied' as the sole 'real cost' of production.
49. For example, in his critique of Smith's concept of an invariable standard (Ricardo, Works I, ch. 1).
50. Schumpeter (1954, pp. 596, 390). See also Meek (1967, pp. 51—74), Dobb (1973, pp. 96—120) and Meek (1977, pp. 149—64).
51. Ricardo's analysis 'leads to erroneous results because it omits some essential links and *directly* seeks to prove the congruity of economic categories with one another' (Marx, 1862b, pp. 164—5). See also Marx (1862b, pp. 167—8, 174, 190, 427).
52. On this basis he also attempted to derive what he considered adequate theories of circulation, rent and money. See Marx (1885, 1894). In this section we ignore all these matters.
53. Marx argued that 'reality as it appears' to social actors and theorists in capitalism is deceptive. He refers to 'reality' as hidden or concealed by 'appearance', or 'content' by 'form', or the 'hidden substratum' by the 'phenomenal form'. It is the role of science to penetrate through the former to the latter and explain 'appearances' in terms of the 'reality'. See Marx (1894, part VII). He further argued that all political economy had so far failed to do this adequately. Theories of supply and demand were considered to be solely concerned with 'appearances' and were dubbed as 'vulgar'. Classical political economy, especially Ricardo, was rated much better, but it too, while laying the foundation, had failed to perceive comprehensively the 'real' structure of determination. This position forms the basis of Marx's theory of false consciousness, fetishism and ideology. See Howard and King (1975, chs 1, 2).
54. We have also noted in note 52 above that we are excluding from consideration Marx's theory of rent. Therefore, we deal with Marxian value theory only as it applies to commodities which are reproducible.
55. In Marx's terminology the worker does not sell his labour but his 'labour power'. He does not sell his 'productive activity' but his 'capacity for labour'. Marx considered this distinction to be crucial for clear thinking and criticised Classical political economy for not realising this. See, for example, Marx (1859, pp. 61—2).
56. This involves Marx's theory of technical change and the 'reserve army of unemployed', 'the pivot on which the law of demand and supply of labour works' (Marx, 1867, p. 639). This is logically

deficient in a number of ways. See Samuelson (1957) and Howard and King (1975, ch. 6). However, we ignore this matter and simply proceed on the assumption that wages are fixed.

57. Marx also refers to the ratio s/v as the 'rate of exploitation'.

58. See Dobb (1973, pp. 146–7) and Howard and King (1975, ch. 3).

59. In analysing a fully developed capitalist system, operating under competitive conditions, Marx always assumes uniformity both in the rate of exploitation and in the rate of profit. As with Ricardo, the latter condition was considered a property of equilibrium. The former condition results from the assumptions that labour is measured in homogeneous units, the wage is uniform and the length of the working day is the same in each activity.

60. By commodity production Marx means an economic system where producers 'carry on their work independently of one another . . . [and] . . . do not come into social contact . . . until they exchange their products' (Marx, 1867, pp. 72–3). Capitalist commodity production is distinguished by wage labour, i.e. by labour power itself becoming a commodity.

61. See Meek (1967, pp. 93–112), Meek (1973, pp. i–xliv), Meek (1977, pp. 120–45) and Howard and King (1975, pp. 45–52).

62. What we have called 'equilibrium price' Marx calls 'price of production' in *Capital*.

63. v_i^* does not necessarily represent unit labour values. Marx, like Ricardo, assumes that outputs are fixed.

64. Marx (1894, pp. 155–7).

65. See also Meek (1977, p. 151).

66. Marx is forever pointing to the 'socialisation' of production that occurs under capitalism, and an essential aspect of this is an increasing technological interdependence between different sectors. See Howard and King (1975, ch. 1).

67. Both these writers were not widely known for many years. Only with the publication of Sweezy (1942) did Bortkiewicz's contribution receive its proper attention. The 'rediscovery' of Dmitriev's work had to wait until the 1960s (see Nuti, 1974).

68. In Marx's terminology he assumed the conditions of 'simple reproduction'.

69. In formulating his transformation algorithm, Marx did not explicitly measure prices in terms of labour to compare them with labour values. Instead he normalised prices so that the costs of production, other than profit costs, remained unaffected by the transformation. Such a procedure is valid only under very special conditions. See Morishima (1973, ch. 7) and Shaikh (1977).

70. Bortkiewicz (1907, pp. 202–3). The solutions are as follows:

Defining,

$$f_i = v_i/c_i \text{ and } g_i = \frac{(c_i + v_i + s_i)}{c_i} \qquad i = (1, \ldots, 3)$$

$$p_1^* = \frac{f_1 p_2^*(1+r)}{g_1 - (1+r)}$$

$$p_2^* = \frac{g_3}{g_2 + (f_3 - f_2)(1+r)}$$

$$r = \frac{f_2 g_1 + g_2 - \sqrt{(f_2 g_1 - g_2)^2 + 4 f_1 g_1 g_2}}{2(f_2 - f_1)} - 1$$

It is interesting to observe that neither g_3 nor f_3 appears in the solution for r. The rate of profit is therefore independent of the conditions of production in the luxury department.

71. It is inherent in the Bortkiewicz procedure that not all these conditions can be met unless both (1) the organic composition of capital in Department III is equal to the social average; and (2) the *numéraire* or invariance postulate is chosen in terms of p_3^*. Formal proof of this is provided by Seton (1957).

72. See also, for example, Meek (1967, pp. 143–57) and Laibman (1973).

73. See, for example, Meek (1967, pp. 143–57, Laibman (1973), Howard and King (1975) and Meek (1977, pp. 95–119).

74. Labour values and equilibrium prices are different categories and the units of measurement of both are necessarily arbitrary in a model without 'money'.

75. For a survey, see Harcourt (1972, 1977).

76. See, for example, Garegnani (1970), Pasinetti (1977) and Roncaglia (1978).

77. See, for example, Bliss (1975) and Howard (1979).

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Quesnay's 'Tableau Economique' as a Theorist would Formulate it Today

Paul A. Samuelson[1]

1 INTRODUCTION

Schumpeter used to shock his Harvard classes by declaring that of the four greatest economists three were French.

In view of Schumpeter's boundless admiration for the Newtonian general equilibrium of Walras, and his delight in the elegance of Cournot's partial-equilibrium analysis, two-thirds of his contention we could understand. But to admit François Quesnay into the Pantheon – presumably because his *Tableau Economique* was a precursor of general equilibrium and of Schumpeter's own beloved *circular flow* – that seemed a bit much.

The *Tableau* began in comedy. Mirabeau (1760), who is known not to have understood it, is quoted maliciously by Adam Smith for his extravagant puffery:

> There has been since the world began, three great inventions . . . The first is the invention of writing . . . The second is the invention of money . . . The third is the Oeconomical Table . . . the great discovery of our age.

Fire, the wheel and the invention of brandy must apparently come further down the list.

Overvaluation invites short selling. Contemporaries of the Physiocrats, such as Linguet, cast scorn upon the *Tableau* as the mystic mumbo-jumbo of a mad sect, dismissing it as charlatanical nonsense. Alexander Gray's (1931) useful compact history refers to the *Tableau* as 'an embarrassing footnote' in the history of economics. Gide and Rist (1926) consider the degree of enthusiasm expressed by Mirabeau and other idolisers as 'almost incredible'. Schumpeter, when he came to write down his magisterial *History of Economic Analysis* (1954), treats Quesnay as a bit of a bore and a crank: there Schumpeter writes with patronising coolness about the *Tableau*.

It was Karl Marx who resurrected the *Tableau Economique*, devoting a whole chapter in his *Theories of Surplus Value* to the *Tableau* and writing: 'Never before had thinking in political economy reached such heights of genius.' Marx's own analytical work on models of *steady reproduction*, and of *expanded* (exponential) *reproduction*, seems to have been stimulated by his puzzling over Quesnay's arithmetic. To be able to say this heaps much praise on the Physiocrats since, I would argue, Marx's own finest *analytical* work came in this area of circular interdependence.

My old teacher Wassily Leontief (1941) had Quesnay very much in mind when he referred to his own endeavour to construct a statistical '*Tableau Economique* of the United States'. It is thus not surprising that members of Leontief's workshop – the late George Malanos (1946), Almarin Phillips (1955), Shlomo Maital (1972), and others – should have offered interpretations of the *Tableau* in terms of modern Leontief–Sraffa input–output systems. (Dialectically, Harry Johnson (1974) reacted against such a *technological* interpretation, preferring a Keynesian *multiplier–expenditure* interpretation to an input–output one.) Tibor Barna (1975) gives a version of the *Tableau* in modern guise, disaggregating the sectoral flows and providing an expanded matrix of transactions.

W. A. Eltis (1975, p. 168), who has analysed the various tableaux against the background of all the writings of Quesnay and Mirabeau, states:

Almost all the problems (assertions that have no clear

logical basis . . . apparent gaps in the arguments, inconsistencies, and puzzling calculations . . .) are solved, however, and the inconsistencies removed when Quesnay's published works are read as a whole.

Eltis is one of the few modern authors bold enough to tackle Quesnay's zig-zags or diminishing geometric progressions.

Although I recognise the role obscurity can play in commanding respect and evoking attention to a scientific work, my own bent is against mystification and abracadabra. Hume and Cantillon, Quesnay's predecessors, and Turgot, Quesnay's successor, are more to my personal taste than Mirabeau and Quesnay. But in recalling the praises and abuses the *Tableau* has evoked, I shall give Ronald Meek (1962, pp. 259–60) the last word:

> The *Tableau* is far from being the ideal and airy thing which it is sometimes made out to be: on the contrary, it is one of the most striking examples in the whole history of economic thought of the achievement of a harmonious unity between abstract theory and concrete investigation.

2 PRESENT PURPOSE

I shall not add one more explication of the many versions of the *Tableau* and its appended materials. Instead, my intent here is to try to put the fundamental Physiocratic insights into modern goatskins.

How would a student of Robert Solow or Piero Sraffa, starting from scratch, draw up a table that illuminates the envisaged equilibrium? My interest is theoretical and methodological. The point is not to capture the quantitative and sociological features of the *ancien régime*, and it is not to illuminate Quesnay's own modes of thought and exposition. Although my debts to Phillips (1955), and particularly to Maital (1972), will be obvious, the programme set out here hitherto seems never to have been carried though to completion.

Two features are central to Quesnay:

(1) Land enjoys a special asymmetric position in the Physiocratic system, and our model must reflect that.

(2) By the same token, if labour's 'sterility' is to stand in stark contrast to land's, logic requires us to push to the limit the Classical hypothesis that an unlimited supply of labour can be endogenously created at a specifiable subsistence wage (which could involve only agricultural food – 'corn' – but which could also involve manufactures).

When I first began to lecture on *Dogmengeschichte* several decades ago, I hoped to be able to understand Quesnay's zig-zag notions. It would be nice in this modern formulation to be able to clear up definitively these mysterious geometric progressions; for, I am sure, it is these puzzling patterns of spending flows that captivated the *Tableau's* admirers and critics. Alas, even the recent explorations of Izumi Hishiyama (1960) and Eltis (1975) do not satisfy my analytical conscience. So the best I can do is to use the complete model introduced here to indicate why Quesnay's zig-zags never did fulfil a useful purpose in the analysis of his own system and the crystallisation of his own insights.

3   ASSUMPTIONS

Assume two industries or departments: *agriculture*, which produces food and raw materials; *manufacturing*, which produces clothing, shelter, other finished goods, and (in later elaborated versions of the model) various capital goods.

(1) Farm products – (Ricardian) 'corn' for short – are produced by the given supply of (scarce) land and by labour. (Later, you can allow for durable capital goods' inputs, for seed and other raw materials produced in agriculture.)

Quesnay deals with three classes of people: landowners or *proprietors* (possibly including the Crown and the clergy); the *productive class* of 'farmers' and farm labourers; and *artisans*, the 'sterile' class of people who labour on manufactures (and which includes what we would call 'bourgeois' employers of their own and other people's labour).

As Barna observes, one can easily disaggregate or consolidate the particular classifications of Quesnay. In a first pass at the subject, I find it useful to divide factors of production into fixed *land* (used exclusively, or primarily, in agriculture) owned by landowners or proprietors, and into *labour*, whether employed in manufacturing (as artisans) or in agriculture (as farmers or hired workers). Prior to complicating the model by explicitly introducing time-phasing and pure interest into it, the difference between a rural farmer and a rural labourer is only one of degree of skill and status. Like the Physiocrats, I envisage one farmer as a congealed unit of more than one unskilled labourer; so long as the gear ratio in this equivalence is not allowed to be an endogenous economic variable, we can avail ourselves of the simplification used later by Marx and speak simply of so many units of socially necessary ('least-common-denominator') labour without regard to the breakdown by industry and occupation.

(2) Manufactures are produced by labour (with land of negligible use in the simplest (model) and by raw materials produced on the farm. For simplicity, I begin with the assumption of *fixed proportions* among labour, co-operating raw materials, and output of manufactures.

A caveat is in order concerning the preliminary neglect of time-phasing. For land to be truly the only ultimate source of net product, *à la* Quesnay and Henry George, we are best advised to contemplate a model that is essentially *timeless*. (Or, if the steady states do involve synchronised time leads and lags, either these intervals are so short that the interest component of total costs and incomes is negligible; or else the rate of interest and profit − these are the same thing in the absence of uncertainty and market imperfections − have been established at so low a rate per period as to be effectively ignorable. In any case, as Barna observes, the *Tableau Economique* must be supplemented by a separate statement on capital account, since its own explicit current flows do not register the needed capital information.)

I do justice to the Physiocrats' vision that land's return is the only *produit net*, the only true surplus by virtue of the fact that its supply is given by nature without a needed cost. By contrast, labour's productivity merely repays labour's

needed cost of subsistence; and raw materials' contribution to competitive revenue merely repays its competitive purchase price (which is, in turn, the sum of the land inputs in it and the subsistence cost of the labour needed for it as inputs). To do full justice to this essentially correct Physiocratic vision, I best sacrifice Quesnay's own ambiguous terminologies: the contribution of farm *labourers* is just as 'sterile' as the contribution of manufacturing *labourers*; the former are not 'the productive class' in the true sense of the word 'productive' — for the reason that it is the land they work with *that is alone productive* in producing the Physiocrats' *produit net*. Personally, like Adam Smith, I would avoid the adjective 'sterile' and merely insist that those costs that are paid to labour merely recoup in long-run equilibrium the subsistence cost whereby labour is maintained. Later, when one admits that manufactures also require some land, one realises that it is not the industry that is 'sterile' in the sense of lacking *net* product but rather only the labour and raw materials used there and anywhere which are 'sterile'. In departing from Quesnay's precise categories and terminologies, I actually better bring out his essential vision.

My technological stage directions will be complete after I have given the quantitative *technical coefficients* of labour and raw materials in manufacturing, and have given for agriculture what we would today call the 'production function' relating corn output to the land supply and the varying quantities of farm labour. But before doing this, I need to specify the composition and scale of the *subsistence real wage.* And I need to specify, as Quesnay's models do, how landowners spend their *produit net* or land rents on the consumption of farm products or of manufactures.

Quesnay's zig-zags must have seemed simpler to him if he always assumed 50—50 allocation of spendings. So I partially indulge that penchant and assume that landlords spend half their rents on manufactures and half on farm products.

But, with a bow towards greater realism, I postulate that the subsistence wage consists only of agricultural products (of 'corn'). It is immaterial how high or low I assume the subsistence wage to be, provided only that the quality of the land and the laws of technology enable a finite population of

landless labour to be supported by the given land under a regime of competition for their services.

Quesnay and earlier writers definitely glimpsed at least vaguely the notion of what would today be called a 'production function'. They realised that under better technology France would be able to enjoy a higher level of total land rent while still paying the same competitive subsistence wage. Since mine is to be a modern treatment, I go beyond their vague perceptions and assume in Ricardo's fashion that the greater the rural labour supply employed, the lower must be its corn wage and the higher must be the total of landowners' *produit net*. The equilibrium that we will observe in the *Tableau Economique* for this society will involve a quantity of agricultural labour that is endogenously determinate. Here are the modern equations:

$$\text{Agriculture } Q = F(\text{land, farm labour}) = F(T, L_F)$$
$$= Tf(L_F/T), f'(\ ) > 0 > f''(\ ) \qquad (1.1)$$

For fixed land (or lands), we can set T equal to unity and ignore it in all our equations.

West (1815), Malthus (1798), Ricardo (1817), and J. B. Clark (1899) realised that under a regime of competition by landowners for labourers, there would be a determinate level of farm L_F^* that would just earn the stipulated corn wage, $\bar{w}$. This L_F^* is the root of the equation (that the neoclassicals would call marginal productivity):

$$f'(L_F^*) = \bar{w} \qquad (1.2)$$

Rent (in corn) can then be computed as the residual:

$$R^* = f(L_F^*) - \bar{w}L_F^* \qquad (1.3)$$

To keep the arithmetic simple, I will let rent be half of total farm product, the rest being farm workers' wages.

Half of this rent goes for corn consumption. The other half goes to buy manufacturing product, the only source of demand for such product. Under competition these manufactures sell only at their cost of production – the sum of the

subsistence corn needed to feed the manufacturing artisans and the corn raw material needed for production of manufactures. Thus the residual rent, left over after farm labour gets its subsistence and the only *produit net* in the system, is divided three ways: into landowners' own corn consumption, into the corn needed for *manufacturing* labour's subsistence, and into the corn needed by industry as raw materials. (What the ratio of these last two components is depends upon the technology in manufactures: to keep the arithmetic simple, I pick one-to-one as that ratio in my examples.)

4 BIRD'S-EYE VIEW

The stage has now been completely set. The play must now go on for ever more according to its coded laws of motion:

(1) Landowners buy from agricultural and manufacturing producers, paying from their stream of competitive money rents and receiving in return the physical goods that constitute their standard of life.

(2) The farm sector, besides selling to landowners, sells its product to labourers who need subsistence — i.e. they sell both to farm labour and to manufacturing labour. The farm sector also sells its product as raw materials for industry.

(3) Out of the total revenues it receives, the farm sector pays competitive rents for the land it needs. It also pays out wages to farm labour, paying the competitive wage that the existing supply of such labour can command (at auction, so to speak).

(4) The size of the farm population supplied is determined in final equilibrium at that level which will fetch the needed subsistence wage. (Were L_F too large, the corn wage would sink below the subsistence $\bar{w}$ and the population would decline; were L_F below L_F^*, the corn wage would exceed $\bar{w}$, thereby evoking a growing supply of farm labour. QED.)

(5) The sole receipts of the industrial sector, under my first simplifying assumptions, come from consumption purchases by landowners spending their rent incomes. In the competitive equilibrium these receipts are just enough to offset the subsistence wages that are forced by competition out of the indus-

trial employers (who may be self-employed) plus the cost of the raw materials that have to be bought from the farm sector. There are no land factors in the industrial sector that can earn a *produit net*; the labour and raw-material inputs merely recover their costs of production and reproduction.

A picture or numerical table to sum this all up might well have pedagogical convenience. But it is an illusion to think that such a picture or *gestalt* provides a magic engine of analysis for the discovery of new truth and the marshalling of rigorous proof. Consider, for example, a typical problem propounded by Quesnay: What if landowners alter their 50–50 spending of rents, and increase the fraction spent on manufacturing products? A one-point-in-time *tableau*, geared to the previous spending proportions, cannot answer the question of what the new equilibrium will be. Barna (1975, p. 493) cogently criticises Quesnay's procedures:

> Quesnay, as usual, begins the computation with the landlords spending their income. At the end of the first round landlords find that they did not collect in rent as much as they had originally spent, and hence the second round starts with a smaller outlay. There is thus a cumulative decline in the 'base' of the *Tableau* and everybody will be worse off then before.
>
> This conclusion clearly does not follow from the *Tableau's* assumptions. Within the framework of a static Leontief model, a shift in demand from agricultural produce to manufactures should bring about a reduction in agricultural activity and an increase in manufacturing. There will be a redistribution of incomes away from landlords. But there is no reason why total national income should change.

In the rockbottom Physiocratic model adumbrated here, the effect of the specified change in tastes is clear. And its correct description seems not to have been achieved by Quesnay and Mirabeau or, according to my best recollection, by any of the commentators on them. Here is that correct description:

A shift in landowners' tastes towards manufacturers must

lead to a new long-run equilibrium with *increased* labour population, all of which goes into manufacturing. Total rent (*produit net*) is *just as before* (whether measured in terms of corn or in terms of manufactures)! What Ricardo calls 'gross revenue' — which, in the Kuznets manner, adds the total of wages to the total of Ricardian 'net revenue' (equals rent or *produit net* in this interestless world) — will be *higher* in the new equilibrium, precisely as Ricardo came to argue in the notorious chapter on machinery that he added to his third edition. (See p. 393 in the 1951 Sraffa edition of Ricardo's *Principles*.)

Barna's point is well taken that you could never conclude all this from the *Tableau Economique* itself. You would have to go to the table's underlying logic to arrive at this result.[2]

5   AT LAST A TABLE

Three sectors are in our model: agricultural production, manufacturing production, and the production of labour (out of subsistence wages). Table 1.1, with three columns, shows

TABLE 1.1

Tableau Economique

	Purchasing sector				
Output	Agriculture	Manufacturing	Labour	Landowners	Totals
Agriculture (product)	0	25	*125*	50	200
Manufacturing (product)	0	0	0	50	50
Labour (supply)	*100*	25	0	0	*125*
Land	100	0	0	0	100
Value totals	200	50	*125*	100	475

the costs of these respective industries broken down by the inputs those costs are spent on. Each input appears in its respective row — including the input of land (which is not itself producible in the system and so appears as a row appended *outside* the 3 × 3 input—output elements of the system). Finally, I append a final column to show how landowners spend their incomes.

I end up with a familiar *open-end* Leontief *tableau*, consisting of 3 × 3 internal elements plus appended exogenous row and column for Physiocrats' land and landowners. The *tableau* is expressed in money terms: dollars, livres, pounds, com- *numéraire* units, etc. It can also be given a physical-units interpretation.[3]

The bold-face numerals denote *produit net* items, the only true surplus in the Physiocratic system and attributable to land alone, with its *zero cost* and *positive productivity. Produit net* (or Ricardian *'net* revenue') is 100, and reckonable in two equivalent ways: as a flow of rent *income* (or cost), it is the 100 in the first column and land row (carried over in the totals column on the right as the last row's item); as a flow of (final) product, it is shown as 50 and 50 in the landowners' column of consumption expenditure.

To get modern national income of *225 à la* Kuznets (or (Ricardo's *'gross* revenue'), we must add wage incomes to rent income. I have italicised these wage value-added items: in the third row for labour, note the wage items *100* and *25*, and their sum on the far right. As a matching Kuznets flow of (non-intermediate) product, we must add to landowners' con- sumptions of corn and manufactures the corn that goes for workers' subsistence. This is shown in the first agricultural row in labour's third column — by the italicised numeral there, *125*. (This last of course appears as a repetition in col- umn 3's bottom total, where *125* is seen.) To relate modern national income to the smaller Physiocrats' *produit net*, I have introduced brackets to enclose the two magnitudes.

Finally, as is well known to users of input—output tables, the grossness of our data depends upon the arbitrary fineness of our disaggregation. The over-all total of 475, shown at lower right in the circle as a grand total of the whole table, has no intrinsic significance: it involves not only the double-

counting of the agricultural output that is used as raw-material input for industry; but, more singularly in modern eyes, it includes labour power as a produced item in the system; and, of course, it includes both landowners' earnings *and* their equivalent spendings, a palpable case of double-counting.

To help relate my presentation to that of Quesnay, Meek, Phillips, and Maital, I consolidate my 4 x 4 (open-end) table into the more conventional 3 x 3 (*open*-end!) format. Now labour will no longer be given its own row and column. Instead, I now put the farm labour back in the 'productive' sector of agriculture, treating the subsistence wage that workers receive there as 'corn raw-material input necessary to produce corn output'. Likewise the manufacturing labour and their corn wages are treated merely as the costs of the sterile classes ('artisans'), who produce manufactures out of an equivalent market value of farm product as input — out of actual raw farm materials themselves used in manufactures *plus* the subsistence corn in the artisans' stomachs while they produce manufactures.

Arithmetically, this consolidation involves eliminating column 3 and row 3 but adding row 3's items into the respective first-row items. This gives Table 1.2, a formal variant of Table 1.1. The *produit net* items are again put in bold face, both on the side of income earned and the side of equivalent flow of final product (net, after allowances to keep labour

TABLE 1.2

Tableau Economique

Sectoral outputs	Agriculture (productive classes)	Manufacturing (sterile artisans)	Land-owners	Totals
Agriculture	100	50	**50**	200
Manufacturing	0	0	50	50
Land	**100**	0	0	**100**
Value totals	200	50	100	**350**

alive and recouping their human reproduction costs). Table 1.2 does not conveniently tabulate Kuznets's national income of 225, since intermediate product of corn used to produce manufactures is mixed up with the requisite numbers.

Both my tables side with Maital against Phillips on the issue of whether Quesnay's *Tableau Economique* is best rendered by a *closed*-end Leontief table or by an *open*-end one. In Phillips's closed-end case, land and landowners are treated symmetrically with any other input or class. To make wine you really do need grapes; but it is stretching convention to say that to produce proprietors you need so many luxuries of this kind and so many of that. It is better to open end the array, pulling land out as a *primary* input and pulling landowners' final consumptions out as items dictated by exogenous tastes.

The Physiocratic asymmetry of land comes of course from their theory of reality. The table is made to reflect it, and it would not be useful to say that the *Tableau Economique* somehow 'proves' the correctness of this insight. Nor would it be useful to blame it for failing to provide such 'proof'.

I shall leave to the interested reader the task of making a pretty picture of my table, with pedagogically useful arrows indicative of spending channels. Perhaps there is a best, canonical pattern that such a diagram should take, but I do not dare to pronounce on the matter.

*   *   *

There remain two quite different tasks. There is the task of discussing zig-zags, the geometric progressions somehow supposed to be indicative of 'dynamic' spending processes. And also there is the task of facing up to time-phasing and to some of the durable capital-goods processes that Quesnay had explicitly in mind. (This will involve not only Quesnay's 'depreciation of capital' but also Turgot's true interest rate.) On both these issues I shall be very brief.

6   THE CHIMERA OF ZIG-ZAGS

So far there has been no need to even mention the mysterious

zig-zags of the Quesnay literature. A typical one, I suppose, is very roughly of the form shown in Figure 1.1. Or, since my model has neither workers spending their subsistence wages on manufactures nor corn producers needing manufactures as raw material or durable capital, after the second round no new flows come to the sterile sector of manufacturing. So the slightly less transparent pattern shown in Figure 1.2 might perhaps be the indicated zig-zag.

In the preceding paragraph I have used the tentative words 'I suppose' and 'might perhaps' because no definite prescriptions are possible until one has already settled what the intrinsic logic of the zig-zag is — which is the objective of the immediate investigation and ought not to be presumed settled in advance.

First, let me dispose of an empty point. Formally, unity can be written as

$$1 = \tfrac{1}{2} + \tfrac{1}{4} + \tfrac{1}{8} + \ldots + (\tfrac{1}{2})^n + \ldots$$

And, for any positive x, we can write the convergent series

$$1 + x = 1 + [x/(1 + x)] + [x/(1 + x)]^2 + \ldots$$

Agriculture   *Manufacturing*

100 of rent
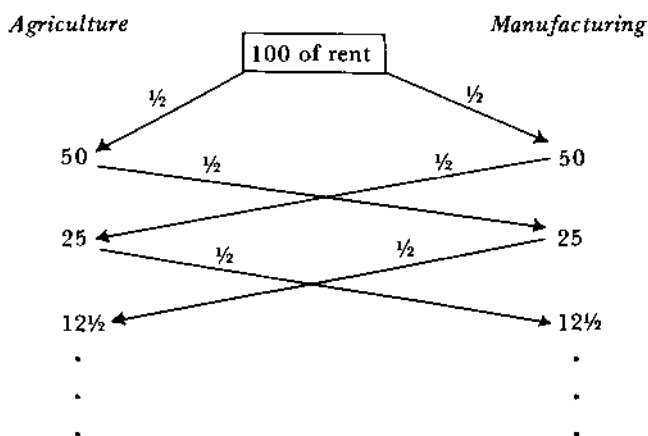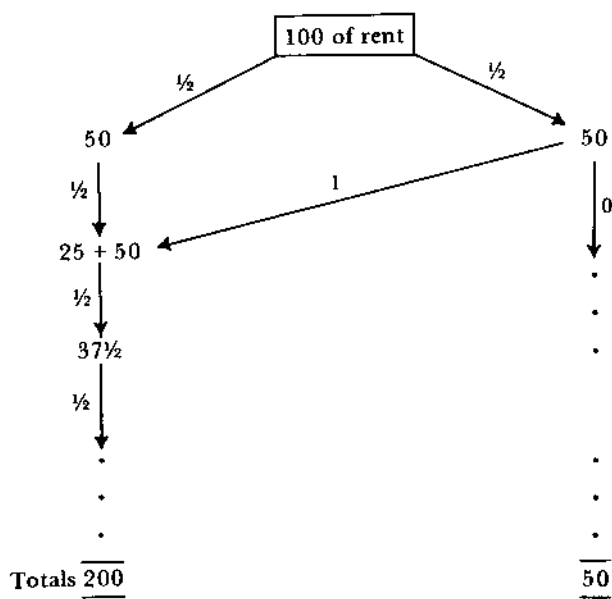
FIGURE 1.1

FIGURE 1.2

But *cui bono?* In the first flush of the Keynesian dawn many of us could write one-plus-one only as $1/(1 - \frac{1}{2})$. At least we then had the excuse that the Kahn—Keynes—Metzler dynamic multiplier could usefully take the difference-equation form:[4]

$$y(t + 1) = \tfrac{1}{2}y(t) + b$$

$$y(t) = \frac{1}{1 - \frac{1}{2}} + [y(0) - 2](\tfrac{1}{2})^t$$

$$\lim_{t \to \infty} y(t) = 2b = [1 + \tfrac{1}{2} + (\tfrac{1}{2})^2 + \ldots]b \qquad (1.4)$$

No doubt Harry Johnson (1974) had something like this in mind when he hankered for a multiplier—expenditure interpretation of the Quesnay zig-zag *Tableau* in preference to a technical input—output approach of the Phillips (1955) type. But I am not aware that Johnson ever made good his claim that the Quesnay zig-zag could usefully model *the* actual dynamic steps forward either (i) when the system is in its

postulated steady state, or (ii) when it is dynamically being perturbed from an old steady state to a new one.

The essence of circular flow — the essence of what Schumpeter admired in Quesnay — is the repetition *without leakage* of the equilibrium. From this viewpoint we do not want to break 100 down into dwindling fractions, but instead want it and all the other elements to *repeat* in conserved magnitude:

$$100 = \ldots = R(t-1) = R(t) = R(t+1) = \ldots \qquad (1.5)$$

No doubt the keen reader will cogently reply to my argument of the previous paragraph:

> True, equilibrium involves stationariness. But every student of J. M. Keynes (1936) and Fritz Machlup (1939) knows that a plateau can be made up of the convergent sum of (an infinity of) overlapping elements — just as a stationary population can be the sum of all the age classes, with each cohort of new births forming a dwindling sequence as each passing year adds a year of age.

This logic is impeccable. But it leaves moot whether there is a *useful* dynamic paradigm that moves forward in time according to the Keynesian manner and which is in some measure illuminated by Quesnay's traditional zig-zags.

My own desultory researches make me agnostical. Code the elements in Table 1.2 as follows:

$$\begin{bmatrix} 100 & 50 & 50 \\ 0 & 0 & 50 \\ 100 & 0 & 0 \end{bmatrix} = \begin{bmatrix} z_1 & z_2 & z_3 \\ & & z_4 \\ z_5 & & \end{bmatrix} \qquad (1.6)$$

My stage directions, and Quesnay's when he accepts my assumptions about tastes and technology, lead to the homogeneous difference equations:

$$z_3(t+1) = \tfrac{1}{2} z_5(t) = z_4(t+1)$$
$$z_1(t-1) = \tfrac{1}{2} [z_1(t) + z_2(t) + z_3(t)] = z_5(t-1)$$
$$z_2(t-1) = z_4(t) \qquad (1.7)$$

These are incapable of being put in 'causal form' either forward or backward in time. Thus, for arbitrary $[z_j(0)]$ it is not the case that a unique sequence is generated for $[z_j(+\mid t \mid)]$ or for $[z_j(-\mid t \mid)]$. However, for $[z_j(0)]$ proportional to Table 1.2's equilibrium values, that same set of values gives a solution that satisfies the equations forever more. This suggests that Quesnay's attempted use of the tableau was flawed at the core: once he altered his parameters and ruptured the old equilibrium, its initial conditions could not begin a path to the new equilibrium. What he inferred to be a property of the real world was only a property of his misconceived programme — something his readers might have come to realise.

Is it quite hopeless, then, to seek some kind of geometric progression that correctly relates to our equilibrium system? Not quite. There is the teleological backward-in-time process known in the input–output literature as a Cornfield–Leontief (matrix) multiplier (and which is not to be confused with the dual pricing multiplier of Gaitskell–Dosso).[5]

Here is how to describe the process. Begin with 100 units of landowner expenditure that generates 50 each of the two sectors' consumptions. To produce these at initial $t = 0$, we needed to produce at $t = -1$ the raw materials and worker fodder called for by the paradigm's technology of input–output coefficients. But to produce these inputs at $t = -1$, we needed *their* inputs to be produced at $t = -2$. These in turn needed their inputs to be produced three periods back.

We are in an infinite regress, going not forward into the far future, but hypothetically backward to the beginning of time. Although the span of time is infinite, the series is a dwindling one with a convergent sum. It is actually the matrix power series of note 4 (see p. 75).

It would be somewhat farfetched to claim that Quesnay's zig-zags were a vague anticipation of the planner's teleological matrix multiplier. There is, however, one instance of the matrix multiplier in which its elements are *exactly* in geometric progression from the very beginning (and not just asymptotically *à la* note 4). Consider a two-sector example in which land and raw materials produce those sectoral outputs without explicit mention of labour. Let half of the cost of manufactures be agricultural raw materials and half of corn's cost be

manufacturing raw materials, the other half being land rent in each sector. This singular case involves neither sector requiring its own self as input.

Figure 1.3 shows the Cornfield—Leontief teleology in quasi zig-zag form. This is not much of a harvest for several decades of mulling over Quesnay's zig-zags, you will agree. But it is the best I can do, and that best does not seem good enough.[6] It seems gratuitous to read this interpretation into Quesnay himself.

100 of rent (1980)

50 corn (1981)   50 mfrs (1981)

25 corn (1980)   25 mfrs (1980)

12½ corn (1979)   12½ mfrs (1979)

$100/2^{300}$ corn (1682) $100/2^{300}$ mfrs (1682)

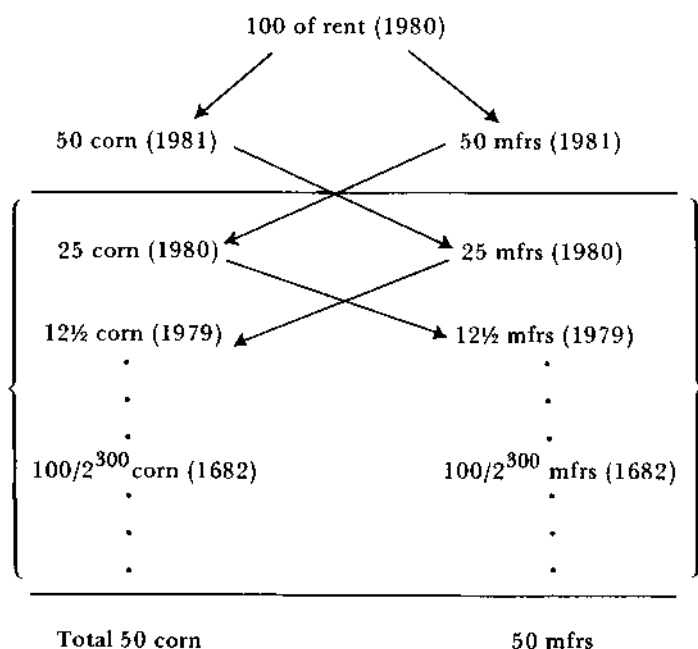Total 50 corn   50 mfrs

FIGURE 1.3

7   CAPITAL GOODS

Quesnay was one of the first Classical economists to concentrate on 'advances' — as when the farmer begins with a barn and with seed, and a worker is provided with the subsistence he needs to last out the growing season. Turgot, not quite a

Physiocrat but at heart a 'fellow traveller', gave what Böhm-Bawerk called the first scientific theory of the interest rate: if land with a permanent annual *produit net* sells for a finite price, as in the medieval 'twenty years' purchase', then that interest rate calculated as annual-yield-to-principal sets the level that capitalists must competitively earn on their outlays for wages, for raw materials, and for barns or durable tools.

Neither Quesnay nor the *Tableau Economique* adequately handles the fundamentals of the profit rate and the time-phasing problem. That would be too much to ask of the eighteenth century. What I shall do is provide the simplest *Tableau* that consistently recognises interest.

My model preserves the subsistence-wage theory. It sticks to the stationary state. Just as rent income is spent half-and-half on agriculture and manufactures, so will be the profit-interest income of capitalists. Indeed, we could for the present purpose alternatively lump together *proprietors* and *rentiers* into the *capitalists*.

Since it already had the circulating-capital item of raw materials needed for manufacturing and had subsistence workers who were 'advanced' their subsistence pay, my previous model can be made to serve the present purpose — once we alter its 'timeless' properties and time phase it so that all outputs come one period *after* the application of all inputs. For brevity, I stick with the earlier model and forbear to introduce durable-capital items.

Where shall I get a determinate positive rate of profit from? Turgot's vision of the process is good enough for us, and recently in the Abba Lerner *festschrift*, Samuelson (1979) sketched a Turgot—Modigliani life-cycle model of interest. Here is its thumbnail outline.

At a zero interest rate, land would be of infinite value. Capitalists looking forward to a finite life (for themselves and the next few generations they care about) would overspend their incomes. So equilibrium can take place only at some positive rate of interest. If that rate per period, call it *r*, is too high, the capitalised value of land will be less than people need for their old-age livelihoods, and would-be savers will bid up assets' values until *the interest rate is at that equilibrium level where generation after generation there will be zero net*

saving. So r^* will be the determinate long-run rate of interest.[7]

At a positive profit rate the same land cannot support so many workers if their competitive wage rate is to equal the needed subsistence level in corn. So L_F^* will be lower than in the zero-r^* case. That means that landowners' corn rent, R^*, payable at the end of the harvest, will be lower than before. The determinate levels for these will be given as (L_F^*, R^*) roots of

$$\bar{w} = f'(L_F^*)/(1 + r^*) \tag{1.8}$$

$$R^* = f(L_F^*) - \bar{w}f'(L_F^*) \tag{1.9}$$

$$\text{Agricultural profit}^* = \bar{w}L_F^* r^* \tag{1.10}$$

The rentier group of capitalists, who advance farm workers their wages, are seen to earn the profit rate on these advances (just as the landowners' rent earns them the same percentage on the capitalised value of their acres).

Now that the population working the land has been lowered by the presence of interest, it takes relatively more land to produce each unit of corn. This tends to raise the price of corn relative to the rent per acre, an effect that is reinforced by the profit mark-up on the wage component of corn's cost. The price of manufactures includes *two* profit mark-ups in my model's technology: the one mark-up already in the price of the corn raw material, and the profit mark-up on the wage and raw-material components of manufactures' cost.

*   *   *

To dramatise the effect upon the *tableau* of profit, I shall assume a 50 per cent interest rate. The task of writing down a new *Tableau Economique* consistent with the technology and tastes of our previous zero-profit *Tableau Economique* provides a testing for a modern theorist. So it is no wonder that the eighteenth-century writers fall short of accomplishing this goal.

Table 1.3 bases itself on a quasi-realistic agricultural production function in expression (1.1) above (p. 51). Raising r^* from zero to 50 per cent per period reduces total population

TABLE 1.3

Tableau Economique (cum profit)[a]

Purchases by → Sales of ↓	Agriculture	Manufacturing	Labour	Capitalists	Landowners	Totals
Agriculture	0	20	60	20	40	40
Manufacturing	0	0	0	20	40	60
Labour	40	20	0	0	0	60
Profit (or interest)	20	20	0	0	0	40
Land rent	80	0	0	0	0	80
Totals	140	60	60	40	80	380

$r^* = 0.5$.

[a] All these values are in terms of corn as *numéraire*. If desired in manufactures as *numéraire*, multiply every item by two-thirds. Values in monetary units (dollars, livres, . . .) depend upon monetary assumptions – such as the money supply and its transactions velocity.

by more than half — from 125 to 60; lowers land rent by 20 per cent, from 100 of corn to 80; raises P_M/P_F from 1 to 1.5. With landowners and rentiers each spending half their incomes on farm goods and manufactures, the composition of the new *tableau* becomes determinate and takes the magnitudes shown in Table 1.3.[8]

With positive profit, my open-end *tableau* enlarges from a 4 x 4 to a 5 x 5 array: a new (fourth) row has been added for the profit component of sectors' costs; and a new (fourth) column has been added for capitalists' consumption expenditure of their profit on agricultural and manufacturing products.

The brackets show modern national income, equal in corn *numéraire* units to 180. Land's share of the reduced total product has dropped from one-half to four-ninths, now that profit usurps a share; labour's share has dropped from one-half to three-ninths. The real value of land's rent has dropped by one-fifth in terms of corn, and by even more in terms of manufactures. Each worker gets the same subsistence wage in corn as before, but now the real wage in terms of manufactures is down by one-third.

To pierce the veil of market values, Table 1.4 presents the exact physical magnitudes underlying Table 1.3.

8   CLOUDING UP *PRODUIT NET*

Once Turgot and Quesnay admit profit into their system, there arises some embarrassment in treating land rent as the sole component of *produit net*. Or, to sidestep circularity in the defining of *produit net*, I can put it this way:

(1) Manufacturing revenues no longer *merely* cover the 'cost elements' in manufactures. Subsistence fodder to reproduce workers seems to be a more legitimate 'cost' than capitalists' interest and profit is.[9] Unless one elevates 'waiting and abstinence' to the level of genuine real costs, they could seem to involve elements of 'surplus' or even of 'exploitation'. Land rent is indeed a surplus, but with the saving grace that the land is at least 'productive' whatever be the demerits of the land's owners.

TABLE 1.4

Tableau's physical magnitudes[a]

Sectors	Agriculture	Manufacturing	Labour	Capitalists' consumption	Landowners' consumption	Totals
Agriculture	0	20 corn	60 corn	20 corn	40 corn	140 corn
Manufacturing[b]	0	0	0	13 mfrs	26 mfrs	40 mfrs
Labour	40 labourers	20 labourers	0	0	0	60 labourers
Land	1 land unit (of 100 acres)					1 land unit

[a] The sole capital in this model is 80 of corn, 20 advanced as raw materials for manufacturing and 60 advanced as subsistence wages.
[b] Second-row items are those of Table 1.3 multiplied by two-thirds.

(2) There are models in which interest can be given a semblance of true productivity but my Table 1.3's example differs from Table 1.1's not a bit in technology. Involving less of population and of farm raw material needed for manufactures, Table 1.3 possesses even less of useful capital goods than Table 1.2 did. So one can understand why Marx would not have been tempted to regard its profits as either legitimate costs or as the return to a 'productive' input.[10]

Twentieth-century theorists try harder than eighteenth-century theorists did to keep normative attitudes from contaminating correct analysis of positivistic fact. So it is as well if the honorific category of *produit net* begins to get complicated in realistic models.

9   CONCLUSION

Embarrassing or not, the *Tableau Economique* has been an interesting footnote in the history of economic thought. Dr Quesnay was not a young man when he first fabricated it. After studying Quesnay's many jousts with the problems it raises, one is not surprised to learn that Madame Pompadour's physician believed he had matched his contribution to economics by his contribution to mathematics in the form of a successful squaring of the circle.

Where early pioneers are concerned, posterity must be grateful for what they accomplished and must not scold over mere imperfections.

MATHEMATICAL APPENDIX

1.   Here is how the *Tableau Economique* of my Tables 1.1 and 1.2 are rigorously determined when $r^* = 0$. The steady-state production functions for the agriculture and manufacturing sectors are given by

$$Q_1 = F[T, L_1]$$
$$= f(L_1) \text{ if } T = 1, f'(\ ) > 0 > f''(\ ) \tag{A.1}$$
$$Q_2 = \text{Min}[Q_{12}/a_{12}, L_2/a_{L2}] \tag{A.2}$$
$$= \text{Min}[Q_{12}/\tfrac{1}{2}, L_2/\tfrac{1}{2}] \text{ in my example}$$

The corn subsistence wage of $\bar{w}$, which can be unity by proper choice of corn and labour units, determines L_1^* by

$$f'(L_1^*) = \bar{w} \tag{A.3}$$
$$= f'(100) = 1 \text{ in my example}$$

Corn output and corn rent are given by

$$Q_1^* = f_1(L_1^*) \tag{A.4}$$
$$= f_1(100) = 200 \text{ in my example}$$
$$R^* = Q_1^* - \bar{w}L_1^* \tag{A.5}$$
$$= 200 - 1(100) = \tfrac{1}{2}Q_1^* = 100 \text{ in my example}$$

In the equilibrium of (A.1) every competitive farm firm has production coefficients given by

$$\begin{bmatrix} a_{L1}^* \\ a_{T1}^* \end{bmatrix} = \begin{bmatrix} L_1^*/Q_1^* \\ T/Q_1^* \end{bmatrix} = \begin{bmatrix} L_1^*/f_1(Q_1^*) \\ 1/f_1(Q_1^*) \end{bmatrix} \tag{A.6}$$

$$= \begin{bmatrix} 1/2 \\ 1/200 \end{bmatrix} \text{ in my example}$$

The following prices can be set at unity by virtue of my choice of units and coefficients $[P_1^*, P_2^*, W^*, W/P_1 = \bar{w}]$. With $T = 1$ earning 100 units of rent, the rent rate per unit is 100:

$$P_1^* = W^* a_{L1}^* + (\text{rent rate}) a_{T1}^* \tag{A.7}$$
$$= 1(\tfrac{1}{2}) + 100(1/200) = 1 \text{ in my example}$$

$$P_2^* = W^* a_{L2} + P_1^* a_{12} \tag{A.8}$$
$$= 1(\tfrac{1}{2}) + 1(\tfrac{1}{2}) = 1 \text{ in my example}$$

Since $R^* = 100$ and I have made Quesnay's assumption that half of the income is spent on agriculture and on manu-

facturing:

$$P_1 C_1^* = R^* = P_2 C_2^* \tag{A.9}$$

$$C_1^* = 1(50) = \tfrac{1}{2}(100) = 50 = C_2^* \text{ in my example} \tag{A.10}$$

$$L_2^* = a_{L2}Q_2^* = a_{L2}(C_2^* + 0) \tag{A.11}$$

$$= \tfrac{1}{2}(100) = 50 \text{ in my example}$$

Total corn must equal subsistence for all $(L_1^* + L_2^*)$ workers plus raw materials for manufacturing plus landowners' corn consumption:

$$Q_1^* = \bar{w}(L_1 + L_2) + Q_{12} + C_1 \tag{A.12}$$

$$= 1(150) + 25 + 50 = 225 \text{ in my example}$$

Also

$$Q_2^* = C_2^* + (Q_{21}^* + Q_{22}^*) \tag{A.13}$$

$$= C_2^* + 0 = 50 \text{ in my example}$$

This completes my Table 1.1 as:

$P_1^* Q_{11}^*$	$P_1^* Q_{12}^*$	$P_1 \bar{w}(L_1^* + L_2^*)$	$P_1^* C_1^*$	$P_1^* C_1^*$
$P_2^* Q_{21}^*$	$P_2^* Q_{22}^*$	0	$P_2^* C_2^*$	$P_2^* Q_2^*$
$W^* L_1^*$	$W^* L_2^*$	0	0	$W(L_1^* + L_2^*)$
R^*	0	0	0	R^*
Σ	Σ	Σ	Σ	$\Sigma\Sigma$

which is equal to

0	25	125	50	200
0	0	0	50	50
100	25	0	0	125
100	0	0	0	100
200	50	125	100	⟨375⟩

2. An equivalent treatment of the subsistence wage requirements involves eliminating the row and column for labour. Instead, add the subsistence corn requirements of industries to the first row's a_{1j}^* coefficients. These now become a_{1j}^* + $\bar{w}a_{Lj}$. My Table 1.2 is then given by:

$P_1^*Q_{11}^* + P_1^*\bar{w}L_1$	$P_1^*Q_{12}^* + P_1^*\bar{w}L_2^*$	$P_1^*C_1^*$	$P_1^*Q_1^*$
$P_2^*Q_{21}^* + 0$	$P_2^*Q_{22}^* + 0$	$P_2^*C_2^*$	$P_2^*Q_2^*$
R^*	0	0	R^*
Σ	Σ	Σ	$\Sigma\Sigma$

which is equal to

100	50	50	200
0	0	50	50
100	0	0	100
200	50	100	(350)

3. There is no reason why, in models more general than my version of Quesnay, land might not be required in more than the first sector. Then $(a_{Tj}) = (a_{T1}, a_{T2}, \dots)$ might have a_{T2} and other a_{Tj} non-zero.

Also, there is no reason why subsistence should be solely in corn. Instead, the ration needed per worker for subsistence could be the column vector $[m_i]$, with

$$\begin{bmatrix} m_1 \\ m_2 \end{bmatrix} = \begin{bmatrix} \bar{w} \\ 0 \end{bmatrix} \text{ in my example} \tag{A.14}$$

But in general m_2, and m_j other than m_1, could *also* be positive.

It would still be true, in the case of $r^* = 0$, that *produit net* equals land rent. Our equilibrium would be given by

$$1 = \sum_1^n (P_j/W)m_j \tag{A.15}$$

If land is a homogeneous scalar — or even if it were a vector of different-quality lands but with each quality of land having the *same* relative efficiency in every use (as when grade **B** has half grade **A**'s effectiveness in every sector)[11] — the relation (A.15) together with the minimum-cost conditions would determine real wage rates, real rent rates, relative prices, and L_j^*/Q_j^* ratios that are independent of the pattern of landlord tastes for consumption. And the real *produit net* would be a total independent of such tastes. See Samuelson (1977b, equations 25) for an 'Adam Smith' model of this type.

4.   Recognising time-phasing, the production functions for the two sectors become

$$Q_1(t + 1) = F_1[T(t), L_1(t)]$$
$$= f_1[L_1(t)] \text{ for } T(t) \equiv 1 \tag{A.16}$$

$$f_1'[\ ] > 0 > f_1''[\ ]$$

$$Q_2(t + 1) = \text{Min}[L_2(t)/a_{L2}], Q_{12}(t)/a_{12}] \tag{A.17}$$

$$[L_2(t), Q_{12}(t)] = [a_{L2}, a_{12}]Q_2(t + 1) \tag{A.17'}$$

$Q_{12}(t)$ is the corn raw material used up in producing manufactures.

Writing $[c_j(t), C_j(t)]$ for consumptions of good j by capitalists and landowners respectively, total outputs are allocated according to

$$Q_2(t) = c_2(t) + C_2(t) + 0 \tag{A.18}$$

$$Q_1(t) = c_1(t) + C_1(t) + \bar{w}[L_1(t) + L_2(t)] + Q_{12}(t) \tag{A.19}$$

In the steady state

$$[Q_j(t), Q_{ij}(t), c_j(t), C_j(t), L_j(t)] \equiv [Q_j, Q_{ij}, c_i, C_j, L_j] \tag{A.20}$$

$$W/P_1 = \bar{w} = f_1'(L_1)/(1 + r^*) \tag{A.21}$$

$$= f_1'(40)/(1 + 0.5) = 1 \text{ in Table 1.3}$$

$$Q_1 = f_1(L_1) \tag{A.22}$$

$$= f_1(40) = 140 \text{ in Table 1.3}$$

$$R = Q_1 - L_1 f_1'(L_1) \tag{A.23}$$
$$= 140 - (40)(1.5) = 80 \text{ in Table 1.3}$$

$$P_2 = (Wa_{L2} + P_1 a_{12})(1 + r^*) \tag{A.24}$$
$$= P_1(\bar{w}a_{L2} + a_{12})(1 + r^*)$$
$$= P_1(\tfrac{1}{2} + \tfrac{1}{2})(1 + 0.5) = P_1(1.5) \text{ in Table 1.3}$$

$$c_1 + C_1 = \tfrac{1}{2}[\text{Total profit} + \text{Rent}] \tag{A.25}$$
$$= \tfrac{1}{2}[r^*(L_1 + L_2) + r^* Q_{12} + R]$$

$$c_2 + C_2 = (P_2/P_1)^{-1}[r^*(L_1 + L_2) + r^* Q_{12} + R] \tag{A.26}$$

$$L_2 = a_{12} Q_2 = \tfrac{1}{2}(c_2 + C_2) = Q_{12} \tag{A.27}$$

Solving (A.25) − (A.27) simultaneously determines for Table 1.3

$$[L_2^*, Q_2^*, Q_{12}^*, c_1^*, C_1^*, c_2^*, C_2^*] = [20, 40, 20, 20, 40,$$
$$\tfrac{2}{3}\,20, \tfrac{2}{3}\,40]$$

5. Quesnay's durable capital goods can be handled expeditiously if any such good is assumed to depreciate exponentially. Thus, replace the Q_{ij} symbol in (A.17) appropriate for the case where the input is all used up in one use by K_{ij}, with $d_{ij}K_{ij}$ being used up in one-period's use. For $d_{ij} = 1$, we have our previous case.

Now, in (A.19), replace the symbol $Q_{ij}(t)$ by $[K_{ij}(t) - K_{ij}(t-1)] + d_{ij}K_{ij}(t-1)$. This takes account of the fact that net investment equals gross investment minus depreciation. Then (A.24) becomes

$$P_2/P_1 = \bar{w}a_{L2}(1 + r^*) + a_{12}(d_{12} + r^*) \tag{A.28}$$

Generally, if we are given for all input–output coefficients the depreciation fractions $[d_{ij}]$, what Leontief and Sraffa write for circulating-capital systems as

$$[I - a_{ij}(1 + r^*)]^{-1} \tag{A.29}$$

we now merely write as

$$[I - a_{ij}(d_{ij} + r^*)]^{-1} \qquad\qquad (A.30)$$

My text skips such inessential complications.

NOTES TO CHAPTER 1

1. The author owes thanks to the American National Science Foundation for financial aid, and to Kate Crowley and Aase Huggins for editorial assistance.
2. In Barna's short run, when the total of farm and manufacturing labour has not yet grown, some L_F will shift to manufacturing. Corn rent will fall. The real wage will rise, both in terms of manufactures and subsistence corn, but more in terms of the latter. Kuznets's national income (Ricardo's gross revenue) will necessarily *rise* reckoned in corn and fall reckoned in manufactures. The terms of trade will temporarily shift against agriculture. All this, however, was not worked out in its entirety until the time of Stolper and Samuelson (1940). What needs mentioning in connection with the short-run case is that *it* does *not* constitute a Leontief—Sraffa one-primary-factor model. With homogeneous land and labour *both* primary factors, Leontief's assumption of fixity of production coefficients would lead to indeterminacies of equilibrium; under the Ricardian assumption of *land—labour substitution*, as in equation (1.1) above, the classical model apes neoclassical properties.

    Quesnay's arithmetic never seems to have led him to the *fundamental theorem of Physiocracy*: that is, no change in tastes can alter the total of long-run *produit net* in a homogeneous-land model where *all other* outputs and inputs are producible at constant returns out of themselves.
3. The base of 100 for land rent is arbitrary: we can define our units of homogeneous land so that there are initially 100 of them. Then, if their number should double or halve, the equilibrium level of *all* other *extensive* variables will double or halve, while all *intensive* price and quantity ratios will be invariants. We can select as our physical units of agricultural product exactly what half a land unit produces (when it has the matching labour to work with). For our units of labour, we define as one labour unit the amount needed (along with land) to produce two units of corn. In terms of these

units the subsistence wage is one corn per period. It follows that the price of corn in *numéraire* units of land rent will be exactly one. Similarly, we are free to select as our physical unit for manufactures the amount of it that requires as raw materials exactly one-half of our farm-product units. Then our example's technology tells us that $P_M/P_F \equiv 1 \equiv P_M$/rent rate.

Adopting the above conventional definitional units, every item in the table becomes a physical magnitude as well as a dollar or livre magnitude. Thus, in column 1, 100 units of land along with 100 workers produce 200 of corn; in column 2, 50 of manufactures is produced by 25 workers and 25 units of farm-product raw materials. The rows can still be added to get totals of physical items. Interpreted as a *physical tableau*, the table's columns cannot be added since cheese-plus-chalk or corn-plus-manufactures-plus-labour-plus-land makes no sense.

4. If $y(t)$ is a column vector of n elements, B a vector of constants, 1 is replaced by the n-by-n identity matrix I, and $\frac{1}{2}$ is replaced by $a = [a_{ij}]$, a matrix of positive elements with column sums positive proper fractions, then expression (1.4) generalises to the 'matrix geometric progression'

$$y(t + 1) = ay(t) + B$$
$$y(t) \quad = [I - a]^{-1} B + y(0)a^t$$
$$y(t) \quad = [I - a]^{-1} B + [y(0) - (I - a)^{-1} B]a^t$$
$$\lim_{t \to \infty} y(t) = [I - a]^{-1} B = [I + a + a^2 + \ldots]B > 0 \qquad (1.4a)$$

The respective elements in a^t or $a^t B$ do not themselves decay in simple geometric progressions (being the *sum* of exponentials), but for a a *primitive* matrix such elements *asymptotically* decay at a common exponential rate. However, as seen in my text, the matrix generalisation cannot vindicate the Johnson spending-chain interpretation but if anything its reverse in time.

5. See Dorfman, Samuelson and Solow (1958) for details.

6. For steady-state purposes, there is no harm in netting out each sector's *own* raw-material requirements. But when the pre-1980 pattern is a genuine planner's programme, phased in real time, technology usually will not allow us to have an $[a_{ij}]$ matrix with zeros in the diagonal. And then the matrix series of note 4, $B + aB + a^2 B \ldots$, will *not* be the simple geometric progressions of Hishiyama (1960) and Eltis (1975), except penultimately.

Remark: the 1980 and earlier *land* inputs needed to produce

the 1980 consumptions are not shown in my zig-zag table. The reader may use the blank middle column to write in the requisite entries 25 (1980), $12\frac{1}{2}$ (1979), ... The sum there will be 50 of land units, representing the *direct* land requirements of the (50 corn and 50 mfrs); the missing 50 of land units is the *indirect* land embodied in the outer columns' totals.

7. Admittedly, r^* will be determined *simultaneously* along with the other equilibrium values $(L_F^*, L_M^*, P_M^*/P_F^*, \ldots)$. For brevity I shall take r^* as already given: at 50 per cent, $r^* = 0.5$, in Table 1.3's dramatic example (p. 65). I mention, but ignore, the possibility of multiple equilibria.

8. See the mathematical appendix (pp. 72–3) for precise equilibrium conditions behind Tables 1.3 and 1.4.

9. See Samuelson (1959a, 1959b) for the Physiocratic version of Ricardo, a version I have essentially plagiarised for Table 1.3. In that version the supply price needed to keep saving neither negative nor positive was the Pickwickian 'cost of reproduction of capital' and all market value was expressible in terms of 'embodied-dated-land-content-marked-up-by-that-profit-rate'.

10. Quesnay used the term 'interest' to name what we call 'capital depreciation'. Suppose we stay with $r^* = 0$ and postulate *exponential* depreciation, with d_{ij} being the fraction of each intermediate input that is used up in any single period's use. Then we can still accomplish what Karl Marx struggled over and doubted could be done: we can express final goods' values in terms of the sum of the values added by land rent and profit or interest on capital items. See the mathematical appendix for some of the details.

11. If, however, T is a vector of heterogeneous lands $(T_1, T_2, \ldots)$ that do not enter into *all* production functions in the same linear aggregate, $\alpha_1 T_{1j} + \alpha_2 T_{2j} + \ldots$, then a change in landowners' tastes might well affect $(P_j/P_1)^*$ and (L_j^*/Q_j^*) ratios. Also, real *produit net*, reckoned as $\Sigma_k(R_k T_k/P_j)$, will then generally be altered by changes in tastes.

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CHAPTER TWO

A Scottish Contribution to Marxist Sociology ?

Andrew Skinner

SECTION 1

The Scottish contribution to what are now known as the
'social sciences' has often been noted, not only by economists
and historians, but especially by sociologists. Albion Small
produced a study of *Adam Smith and Modern Sociology* as
early as 1907, building on an established German tradition,
to be followed, amongst others, by W. C. Lehmann's *Adam
Ferguson and the Beginnings of Modern Sociology* (1930).
Gladys Bryson, influenced to a considerable extent by the
work of sociologists such as Small and Franklin Giddings,
published two important articles in 1932 and 1939, respec-
tively,[1] prior to the appearance of her main contribution, *Man
and Society: The Scottish Inquiry of the Eighteenth Century*
(1945). This (rather underrated) work, while explicitly build-
ing on the findings of others, broke some new ground in
commenting on the contributions of a 'Scottish group' or
'school' whose members were part of a close-knit community.
The contributions to which Professor Bryson referred include
the subject area of psychology as well as of sociology – both
of which are shown to have been deployed in the treatment
of history, 'the absorbing interest' of the period. This distin-
guished tradition was continued with the later works of
Lehmann, on Kames and Millar,[2] not to mention Professor
Macrae's *Ideology and Society* (1961).[3]

But for our present purposes at least it would appear that

Roy Pascal's 1938 article 'Property and society: the Scottish contribution of the eighteenth century' provided the groundwork for a debate which has come to feature both Marxist and non-Marxist interpretations of the Scottish 'School'. In view of subsequent developments it may therefore be useful to recall some of the major points which Pascal made.

To begin with, Pascal *identified* the main members of the 'School' and drew attention to their interest in what could be called a 'new science of civil society'. The emergence of this science was ascribed to a number of forces, such as Scotland's isolation from the seat of government, and the nature and position of her universities, but in practice Pascal seems to have emphasised two elements in particular. First, he drew attention to the consequences of a rapid rate of economic and social change, and second, to the importance of that information concerning primitive peoples which was available to the members of the School. Particular reference was made to contemporary knowledge of the North American Indians, knowledge which gave 'a real basis to speculations deriving from the contrast between a primitive and an advanced civilisation' (Pascal, 1938, p. 169).

Having drawn attention to the *origin* and *nature* of the new theory, Pascal then went on to review its content. In this connection he chose to emphasise the importance of property relations and of the use made of 'four types of society differentiated by different modes of production'; points which led to the conviction that Adam Smith saw the development of civil society as 'a completely secular, material process' (Pascal, 1938, pp. 170–1). In Pascal's eyes, Smith emerges as the founder of a 'new interpretation of society which is undoubtedly materialistic, and which his contemporaries and disciples . . . elaborate' (1938, p. 173). Leading on from this, Pascal was able to place the Scottish writers in the general context of the history of political theory, in arguing that Adam Smith and his successors are to be seen as the critics of the tradition associated with Hobbes and Locke, i.e. as critics of a political science whose 'basic conceptions . . . were abstract, speculative, and rationalistic; abstract and speculative in that it postulated man living in a "state of nature", and rationalistic in that it ascribed the establishment of society to a voluntary act' (Pascal, 1938, p. 167).

The first article which might be seen to build upon the basis provided by Pascal, but without adopting a Marxist stance, is Duncan Forbes's 'Scientific Whiggism: Adam Smith and John Millar', published in the *Cambridge Journal* for 1954–5. Here Forbes widened the debate to include the contributions of Rousseau and Turgot, while concentrating most attention on Smith and Millar. Pascal is shown to have developed Sombart's suggestive remarks with regard to the School's anticipation of 'the historical materialism of Marx', while in the case of Millar it is confirmed that 'everything is explained in terms of the progress of society, and the economic interpretation is basic' (Forbes, 1954, pp. 663–4). In Smith's case especially, attention was drawn to the importance of the four-stages thesis as providing the organising principle behind the treatment of progress, as well as to his use of the doctrine of 'unintended outcomes'; this point is also emphasised by Pascal.

But there is one very important difference, as compared with Pascal, arising from the fact that Forbes was concerned not so much with placing Smith and Millar in the history of political *theory* as with the attitudes adopted by these men to questions which are more directly related to political *science* (in an institutional sense). This theme was to be continued in Forbes's 'Sceptical Whiggism: commerce and liberty', published in 1975. As early as 1954 Forbes was arguing that the attitudes which Smith and Millar adopted to matters of contemporary debate were informed by an understanding of underlying historical processes, and that

> The 'scientific' nature of the Whiggism of Smith and Millar is thrown into relief when it is contrasted with other historical attitudes, especially liberal ones, in England in the later eighteenth century. In relation to the appeal to history by the political reformers of the 70s and 80s, for instance, it may almost be said to stand as Marxian to pre-Marxian socialism, so crude, utopian and mentally parochial is one, so wide in the sweep of its historical survey, and so self-consciously 'scientific' is the other (Forbes, 1954, p. 661).

But whereas Forbes's first contribution to the debate pursued an *analogy* with Marx, Meek's opening article of the

same year (1954) reflected a growing conviction that the Scottish contribution to Marxist sociology was 'greater in degree, and to some extent different in kind, from what has commonly been imagined' (1954, p. 34). In developing this theme, Meek neglected the 'political' dimension of Pascal's essay, while starting from the point at which he had left off, namely with the statement that 'Marx's first thorough exposition of historical materialism, the *German Ideology* . . . builds on the groundwork laid by Smith and his contemporaries' (Pascal, 1938, p. 178).

At the same time, the main weight of emphasis, in this and subsequent works, fell upon the stadial thesis and the sociological propositions associated with it: propositions which were described by William Robertson, in passages which Pascal and Meek have made famous: first, that 'in every enquiry concerning the operations of men when united together in society, the first object of attention should be their mode of subsistence'; second, that the form and distribution of property were sure guides to the source and nature of political power. Or, as Robertson put it, 'Upon discovering in what state property was at any particular period, we may determine with precision what was the degree of political power possessed by the king or by the nobility at that juncture.'[4]

A second major feature of Meek's work is the attention given to the French contribution, a development which was first noted in the *Economics of Physiocracy* (1962) where part I was devoted to translations of Quesnay and Mirabeau, with reference to those works which 'seemed . . . to require special attention, if only because of their striking resemblance to the doctrines of the Scottish Historical School' (Meek, 1962, p. 38). The argument was later extended to include Turgot (following Forbes) in an article published in 1971, and further developed in *Turgot on Progress, Sociology and Economics* (1973). Here the stadial thesis was traced to fragments such as 'Universal History', 'Political Geography', 'Successive Advancements of the Human Mind', and the more complete *Reflections on the Formation and Distribution of Riches* (published in 1769). Meek's research in the general field of physiocracy helped to make obvious 'the crucial role which the "four stages" theory must have played in the

emergence of the new Franco–Scottish view of socio-economic development' (Meek, 1971, p. 22). Writing in *Social Science and the Ignoble Savage* (Meck, 1976a, p. 2) the point was put in an even more explicit form:

> For better of for worse, this 'four stages' theory . . . was destined not only to dominate socio-economic thought in Europe in the latter half of the eighteenth century, but also to become of crucial significance in the subsequent development of economics, sociology, anthropology, and historiography, right down to our own time. It is therefore a matter of some importance to investigate its origins and early development.

As the last statement implies, the conviction that the stadial thesis was 'absolutely central', a 'real intellectual breakthrough' and 'a basic part of the intellectual milieu'[5] led Meek to prosecute a number of subsidiary themes all of which are represented in the *Ignoble Savage*. First, he addressed himself to the 'pre-history' of the thesis, passing in review the contributions, such as they were, of such diverse writers as Aristotle, Grotius, Pufendorf, Hobbes, Locke, Bossuet and Temple, an enterprise which led to the conclusion that:

> Taking them as a whole, the anticipations are indeed so scarce and scattered, and in most cases so vague, that men like Smith and Turgot could hardly have discovered them (in so far as they in fact did so) if they had not known what they were looking for (Meek, 1976a, p. 35).[6]

This in turn *led* to the conviction that the 'origins of the theory must up to a point be sought in sources outside the literature itself' (Meek, 1976a, p. 3) — that is to say in experience, a 'mode of approach' which 'may prove capable of throwing at least a little light upon the great question of causes' (Meek, 1976a, p. 36). In practice, this resulted in a very heavy emphasis on the importance of information regarding the North American Indians (a point mentioned by Pascal), as provided in the works of de Acosta, Ogilby, Lafitau and Charlevoix.[7]

A further strand of argument was devoted to the *dating* of the thesis, where Meek reviewed the contributions of such writers as Maupertuis, Montesquieu, Quesnay, Helvetius, and Goguet, representing the Continent, and Dalrymple, Lord Kames, Ferguson, Robertson and Millar who appeared, as it were, for the Scots.[8] This branch of Meek's work is surely remarkable for the effort that must have been entailed and for the reminder that the thesis was indeed ubiquitous, *as a matter of fact*.

While there is much of value in these materials, there is also a good deal of room for debate. For example, the argument of the section dealing with 'pre-history' often unfolds in such a way as to suggest that the four-stages thesis embodies 'truths' which earlier writers struggled to express with limited success, leading to Quentin Skinner's (1976, p. 156) complaint that the historian of ideas must surely 'focus less on the words on the page, and more on the purposes of the agents using them'. Similarly, the emphasis on America may require some quali-fication when discussing the origins of the theory, bearing in mind the other sources of inspiration already mentioned by Pascal, Forbes, and even Meek himself.

With regard to the 'dating' of the thesis, one might also question the dismissive attitude to Kames, for example, and query the nature of that evidence which suggests that 'it was in fact Smith who was the leader and Dalrymple and Kames who were the followers' (Meek, 1976a, p. 126). Writers such as Donald Winch who remind us that 'law and government were the *subject* of the bulk of the *Lectures*' (Winch, 1978, p. 57) might be more tempted to side with the *lawyers* (such as Neil McCormick (1980) or Peter Stein (1970)) who find in Smith someone who gave his own version of, though he did not invent, the theory of the four stages of human society.

Equally, one may question some of the inferences which were drawn from the analysis, such as Meek's belief that 'the notion that historical processes were autonomous and law-governed' had 'led to (or was closely associated with) the notion that *economic* processes in a commercial society pos-sessed the same characteristics' (1976a, p. 220) — or the view that the four-stages theory could be regarded as the 'first great theoretical embodiment or crystallisation of a set of

wider notions and attitudes – the law of unintended outcomes' (1976a, p. 242). For many, such arguments suggest that Meek may have underestimated the ubiquitous influence of the Newtonian revolution, as well as the importance of specific works, most notably Giambattista Vico's *Scienzia Nuova* (1723).

But points such as those mentioned above are best regarded more as questions than criticisms, questions posed by Meek and others for later students to confront. For the moment, I wish to confine my attention to one part of a single question associated with Meek's belief that the four-stages theory was 'absolutely central' to the understanding of Adam Smith.[9]

It was Meek's firm view that the theory provides the basic conceptual framework within which the major part of Smith's argument is set. It is therefore important to note at the outset that this apparently extravagant claim was carefully qualified, especially in the *Ignoble Savage*. Here attention is drawn to the fact that the thesis does not formally appear in the *Theory of Moral Sentiments*, in the *History of Astronomy*, or *Considerations concerning . . . Languages* – and that it can hardly be said to dominate the *Lectures on Rhetoric* (Meek, 1976a, pp. 114–16). In fact, Meek argued that the four-stages theory was really of major importance only in the context of Smith's *Lectures on Jurisprudence*. It is in the discussion of property that the four-stages theory is shown to have emerged as 'an organising principle of considerable power and importance' (1976a, p. 120), and only in respect of the treatment of public jurisprudence that it appeared in its most complete form. As Meek (1976a, p. 122) put it, here 'the framework of reference throughout is the four stages theory, which is used to an extent and with a degree of sophistication unknown in any of the previous literature'. This is in effect to suggest that the four-stages theory is central to one work and to one, or at best two, parts of that work. Put in this way the claim is surely unexceptionable, and accordingly I seek here merely to confirm the presence of the theory in Smith's work, differing only from Meek in respect of the emphasis given to *Wealth of Nations*, rather than *Lectures on Jurisprudence*, and especially to Book III of the former work.

But there is perhaps more room for argument when

we move beyond the 'stages' themselves to the consideration of the dynamic aspects of Smith's thesis, thereby confronting Meek's (1954, p. 40) claim that 'even if we cannot ascribe *the* materialist conception of history to Smith, we may certainly ascribe to him *a* materialist conception of history'. This view was first stated by Meek in his 1954 article, but repeated much later and at a time when he dryly described himself more as 'a benign middle-aged Meekist' than the 'fierce young Marxist' of the 1950s.[10] The thesis also finds an echo in a review of David Reisman's interesting work on *Adam Smith's Sociological Economics* (1976), where it is noted that this author stresses

> the ubiquity in Smith's work of the modern notion of a causal link between economic basis and social superstructure, and gives a clear and comprehensive account of Smith's ideas about the way in which the character of individual 'nations' and classes depends upon their way of life . . . In all this he does, I think, succeed in proving his point. Those of us who have noticed the importance of these elements in Smith's work, but have hesitated about committing ourselves to a term as extreme as economic determinism, need hesitate no longer (Meek, 1976b, p. 1625).

While taking this claim (like the stadial thesis itself) to be confined to the analysis of public jurisprudence, I would like to suggest that it must be qualified by reference not only to Smith's other works but also in regard to his analysis of the *process* of transition from one socio-economic stage to another as recorded in Book III of *The Wealth of Nations*. It should also be pointed out that the 'materialist' claim has to be further qualified by reference to an aspect of Smith's work which *both* of us undervalued, at least in this connection. The reference is to Smith's analysis, not just of the *origins* of the exchange economy, but also to his treatment of the *nature* of the social and political institutions which might be generated by it — that broadly political dimension to which Duncan Forbes originally drew attention and which has been elaborated most recently by Donald Winch, in his *Adam Smith's Politics: An Essay in Historiographic Revision* (1978).

SECTION 2

COMPARATIVE STATICS

It is now well known that one of the main questions to which Smith addressed himself in *Theory of Moral Sentiments* was that of 'how and by what means does it come to pass, that the mind prefers one tenour [*sic*] of conduct to another' (VII, i, 2). The answer involves the use of a complex series of assumptions regarding the faculties and propensities with which man is endowed, most notably that of fellow-feeling, and gives a good deal of emphasis to the importance of general rules of conduct, both with respect to their origins and to our reasons for respecting them. With regard to these rules, justice emerges as 'the main pillar that upholds the whole edifice', without which the 'immense fabric of human society' must 'in a moment crumble into atoms' (II, ii, 3 and 4). Smith argued that the content of these general rules must be related to experience, and that every 'system of positive law may be regarded as a more or less imperfect attempt towards a system of natural jurisprudence', while recognising that such systems could be affected by the interests of government together with those of 'particular orders of men who tyrannise the government'. As a result he suggested that 'Systems of positive law . . . though they deserve the greatest authority, as the records of the sentiments of mankind in different ages and nations . . . can never be regarded as accurate systems of the rules of natural justice' (VII, iv, 36). In the same work he advanced the further proposition that social order would be impossible without some system of government or magistracy, indicating that otherwise 'civil society would become a scene of bloodshed and disorder' (ibid).

However, it was only in the *Lectures on Jurisprudence* that Smith set out to explain the origin of government and to provide some account of these forces which explained changes in its character through time, deploying in these contexts the four socio-economic stages of 'hunting, pasturage, farming, and commerce' (*Lectures on Jurisprudence* (B), 149).[11]

The first stage of society was represented as the 'lowest and rudest' state, such 'as we find it among the native tribes

of North America' (*Wealth of Nations*, V, i, a, 2). In this case, life is maintained through gathering the spontaneous fruits of the soil, and the dominant activities are taken to be hunting and fishing. As a result, Smith suggested that such communities would be small in size and characterised by a high degree of personal liberty – due to the absence of any form of economic dependence. Smith also observed that in the absence of private property, which was also capable of accumulation, disputes between different members of the community would be minor, 'so there is seldom any established magistrate or any regular administration of justice' in such states. He added that

> Universal poverty establishes there universal equality, and the superiority, either of age, or of personal qualities, are the feeble, but the sole foundations of authority and subordination. There is therefore little or no authority or subordination in this period of society (V, i, b, 7).

The second social stage is that of pasture, which Smith represented as a 'more advanced state of society, such as we find it among the Tartars and Arabs' (V, i, a, 3). Here the use of cattle is the dominant economic activity, and this mode of subsistence meant, as Smith duly noted, that life would tend to be nomadic and the communities larger in size than had been possible in the preceding stage. More dramatically, Smith observed that the appropriation of herds and flocks which introduced an inequality of fortune was that which first gave rise to regular government. We also find here a form of property which can be accumulated and transmitted from one generation to another, thus explaining a change in the main sources of authority as compared with the previous period. As Smith put it:

> The second period of society, that of shepherds, admits of very great inequalities of fortune, and there is no period in which the superiority of fortune gives so great authority to those who possess it. There is no period accordingly in which authority and subordination are more perfectly established. The authority of an Arabian scherif is very

great; that of a Tartar Khan altogether despotical (V, i, b, 7).[12]

While the third economic stage is perhaps the most complicated of Smith's fourfold classification, the basic outlines seem clear. Where property in land is significant, each estate would assume the character of a separate principality, while presenting many of the features of the second state. As in the previous case, for example, the basis of power is property, and, as before, those who lack the means of subsistence can only acquire it through the exchange of personal services, thus becoming members of a group who 'having no equivalent to give in return for their maintenance' must obey their lord 'for the same reason that soldiers must obey the prince who pays them' (III, iv, 5). Each *separate* estate could thus be regarded as stable in a political sense in that it was based on clear relations of power and dependence, though Smith did emphasise that there would be a state of chronic instability in terms of the relationships *between* the principalities.

The stage of 'commerce', on the other hand, differs most markedly from the other stages in respect of the kind and level of economic activity which was envisaged. As Smith put it:

> The great commerce of every civilised society, is that carried on between the inhabitants of the town and those of the country. It consists in the exchange of rude for manufactured produce, either immediately, or by the intervention of money . . . The gains of both are mutual and reciprocal, and the division of labour is in this, as in all other cases, advantageous to all the different persons employed in the various occupations into which it is subdivided (III, i, 1).

A number of points follow from this description. First, Smith describes a situation characterised by the division of labour, and where each service commands a price. As he noted, this means that the direct dependence of the previous period is no longer relevant:

> In the present state of Europe, a man of ten thousand a

year can spend his whole revenue, and he generally does so, without directly maintaining twenty people, or being able to command more than ten footmen not worth the commanding (III, iv, 11).

By the same token it follows that 'Each tradesman or artificer derives his subsistence from the employment, not of one, but of a hundred or a thousand different customers. Though in some measure obliged to them all, he is, therefore, not absolutely dependent upon any one of them' (III, iv, 12).

Second, Smith noted that in this situation the great proprietors of land must confront a change in their situation arising from the fact that the exchange economy provides them, and others, with a means of expending their surpluses, other than on the maintenance of dependants. Smith thus observed that the commercial stage was in general likely to be more stable than the agrarian situation, since

> commerce and manufactures gradually introduced order and good government, and with them, the liberty of individuals, among the inhabitants of the country, who had before lived almost in a continual state of war with their neighbours, and of servile dependency upon their superiors. This, though it has been the least observed, is by far the most important of all their effects (III, iv, 4).

Third, Smith observed that new sources of wealth, arising from commerce, manufactures, agriculture, etc., were likely to be more equally distributed, leading to the expectation, in the words of John Millar (1779, p. 292), that 'power, the usual attendant of wealth, will be in some measure diffused over all the members of the community'.

DYNAMICS

While it must be recalled that the form of argument which we have just reviewed was developed in the context of a discussion of *jurisprudence*, even this cursory account may be sufficient to confirm that the *Wealth of Nations* provides extensive evidence of a thesis which also had a broadly 'socio-

logical' purpose. Looked at in this way the analysis may be seen to employ the technique of comparative statics, at least in the sense that it provides a means of contrasting and comparing different forms of economic and social organisation which may be found to exist at a particular point in time, and of fulfilling a like role when comparing the different forms of socio-economic organisation which a particular society may have attained at different points in time. While there is a good deal of evidence to suggest that the 'stadial' thesis was used in exactly this way, it is equally true that Smith's deployment of the thesis also supports Meek's (1976a, p. 225) view that

> The four stages, at any rate at the outset of its career, usually took the form of a *theory of development*, embodying the idea of some 'natural' or 'normal' movement through a succession of different modes of subsistence.

Now Smith was well aware that the sequence of hunting, pasture, agriculture and commerce need not always unfold in the order suggested. For example, the North American Indians constitute some 'objection to this rule' in that 'They, tho they have no conception of flocks and herds, have nevertheless some notion of agriculture' (*Lectures on Jurisprudence*, (A), i, 29). He also pointed out that the process depended on the satisfaction of certain physical preconditions, such as fertility of the soil and access to good communications:

> Tartary and Araby labour under both these difficulties. For in the first place their soil is very poor and such as will hardly admit culture of any sort . . . Neither have they any opportunity of commerce, if it should happen that they should make any advances in arts and sciences . . . In these countries therefore little or no advances can be expected, nor have any yet been made. But in Greece all the circumstances necessary for the improvement of the arts concurred. The several parts were separated from each other by mountains and other barriers, no less than Arabia, but is far more adapted to culture. They would therefore have many inducements to cultivate the arts and make improve-

ments in society. The lands would be divided and well improved and the country would acquire considerable wealth (*Lectures on Jurisprudence* (A), iv, 62).

In short, where the necessary conditions were satisfied, a certain sequence of stages could be expected, a point which was made explicitly by Adam Smith in a passage which Meek quoted at length in the *Ignoble Savage* (1976a, pp. 117—18):

If we should suppose 10 or 12 persons of different sexes settled in an uninhabited island, the first method they would fall upon for their subsistence would be to support themselves by the wild fruits and wild animals which the country afforded . . . This is the age of hunters. In process of time, as their numbers multiplied, they would find the chase too precarious for their support . . . The contrivance they would most naturally think of would be to tame some of those wild animals they caught, and by affording them better food than what they could get elsewhere they would enduce [*sic*] them to continue about their land themselves and multiply their kind. Hence would arise the age of shepherds. They would more probably begin first by multiplying animals then vegetables, as less skill and observation would be required . . . We find accordingly that in almost all countries the age of shepherds preceded that of agriculture
. . .
But when a society becomes numerous they would find a difficulty in supporting themselves by herds and flocks. Then they would naturally turn themselves to the cultivation of land and the raising of such plants and trees as produced nourishment for them . . . And by this means they would gradually advance into the Age of Agriculture. As society was farther improved, the several arts, which at first would be exercised by each individual as far as was necessary for his welfare, would be separated; some persons would cultivate one and others others, as they severally inclined. They would exchange with one another what they produced more than was necessary for their support, and get in exchange for them the commodities they stood in need of

and did not produce themselves. This exchange of com-
modities extends in time not only betwixt the individuals
of the same society but betwixt those of different nations
. . . Thus at last the Age of Commerce arises (*Lectures on
Jurisprudence* (A), i, 27—32).

The sequence stated implies a certain progression through
time, while seeming to suggest that there is a sense in which
the development of productive forces is to be associated with
certain social (or qualitative) changes. Yet at the same time
it is clear that statements of the kind which we have just
quoted do not of themselves constitute an *explanation* of the
process of transition between stages, nor do they provide an
adequate account of the unfolding process in the context of
those *historical* situations where it was alleged to have taken
place. Smith was well aware of this problem, and it is note-
worthy that his treatment of public jurisprudence, with its
attendant use of the 'four stages', in fact unfolded within the
framework of a *historical* account of the origins and nature
of the present establishments in Europe. It is now well known
that this account opens with the first beginnings of civilisation
in Greece before passing on to Rome and the eventual emer-
gence of the modern European state. In undertaking this task
Smith clearly demonstrated that the four-stages idea is impor-
tant, while also showing that his theory of history is much
more complex than the stadial thesis taken in isolation might
seem to imply. In what follows we seek to illustrate this point
by reference to the analysis of Book III of *Wealth of Nations*
— the most complete, and beautifully articulated, version of
an argument which first appeared in the *Lectures*.[13]
    As Smith presents the case:

When the German and Scythian nations over-ran the west-
ern provinces of the Roman empire, the confusions which
followed so great a revolution lasted for several centuries.
The rapine and violence which the barbarians exercised
against the ancient inhabitants, interrupted the commerce
between the towns and the country. The towns were
deserted, and the country was left uncultivated, and the

western provinces of Europe, which had enjoyed a considerable degree of opulence under the Roman empire, sunk into the lowest state of poverty and barbarism (*Wealth of Nations*, III, ii, 1).

The *cause* of this upheaval was due to the weakened position of Rome, itself a consequence of economic advance. The *result* was in a sense disaster, though it was Smith's view that the domination of the barbarian nations had served to create an environment from which was to emerge a more complex socio-economic stage than that attained by Rome – i.e. that version of the commercial stage which was consistent with the institutions of an economy based wholly on exchange.

Smith's explanation of the general trend begins with the fact that the primitive tribes which overran the empire had already attained a relatively sophisticated form of the pasturage economy, with some idea of agriculture and of property in land. He argued therefore that they would naturally use existing institutions in their new situation and that in particular their first act would be a division of the conquered territories. In this way we move in effect from a developed version of one economic state to a primitive version of another – from the state of pasture to that of 'agriculture'. Under the circumstances outlined, property in land is the great source of power and distinction leading to a gradual change in the laws governing property, and featuring the introduction of primogeniture and entails. The basic point emphasised was that in such periods of disorder, 'The security of a landed estate . . . the protection which its owner could afford to those who dwelt on it, depended upon its greatness. To divide it was to ruin it, and to expose every part of it to be oppressed and swallowed up by the incursions of its neighbours' (III, ii, 3).

Such institutions as these quite obviously reflect a change in the mode of subsistence and in the form of property, thus presenting some important contrasts with the previous stage. On the other hand, the great proprietor has still nothing on which to expend his surpluses other than on the maintenance of dependants – and at the same time has a positive incentive

to do so since they contribute to his own security and hence military power.

In short, the period was marked by clear relations of power and dependence but above all by the state of *disorder and conflict*, which we have already noted — a state of conflict which gave the proprietors some incentive to *alter* the pattern of landholding, in two quite different ways. First, Smith argued that the heavy demands which were inevitably made on their immediate tenants (as distinct from villeins, etc.) for military service would inevitably change the quit-rent system in terms of which land was normally held.

Second, he argued that the same need for protection which altered the relationship between the great lords and their tenants would also lead to patterns of alliance between members of the former group, and therefore to arrangements which gave some guarantee of mutual service and protection. It was for these reasons, Smith argued, that the lesser landowners entered into feudal arrangements with those greater lords who could ensure their survival (thus enhancing their ability to do so), just as the great lords would be led to make similar arrangements amongst themselves and with the king. These changes took place about the ninth, tenth and eleventh centuries, and by imposing some shackles on the free enterprise of the proprietors contributed thereby to the emergence of a more orderly form of government. Yet:

> The authority of government still continued to be, as before, too weak in the head and too strong in the inferior members, and the excessive strength of the inferior members was the cause of the weakness of the head. After the institution of the feudal subordination, the king was as incapable of restraining the violence of the great lords as before. They still continued to make war according to their own discretion, almost continually upon one another, and very frequently upon the king; and the open country still continued to be a scene of violence, rapine, and disorder (III, iv, 9).

Once again a state of instability was to produce some change

in the outlines of the social system, though here kings rather than the great lords emerge as the main actors in the drama.

Smith examines the role of the cities from that period in time when three distinctive features of royal policy with regard to them were already in evidence. First, he noted that cities had often been allowed to farm the taxes to which they were subject, the inhabitants thus becoming 'jointly and severally answerable' for the whole sum due (III, iii, 3). Second, he observed that in some cases taxes, instead of being farmed for a given number of years, had been 'let in fee', that is 'forever, reserving a rent certain, never afterwards to be augmented' (III, iii, 4). Third, Smith noted that the cities

> were generally at the same time erected into a commonality or corporation, with the privilege of having magistrates and a town council of their own, of making bye-laws for their own government, of building walls for their own defence, and of reducing all their inhabitants under a sort of military discipline, by obliging them to watch and ward (III, iii, 6).

It was as a result of following these policies that some kings had achieved the apparently remarkable result of freezing the very revenues which were most likely to increase over time, and at the same time effectively curtailing their own power by erecting 'a sort of independent republick in the heart of their own dominions' (III, iii, 7). Yet in Smith's view the encouragement given to the cities represented in effect a *tactical alliance* which was beneficial to both parties, and in speaking of the burghers, Smith remarked that 'Mutual interest . . . disposed them to support the king, and the king to support them against the lords. They were the enemies of his enemies, and it was his interest to render them as secure and independent of those enemies as he could' (III, iii, 8).

Smith also noted that this development was directly related to the weakness of kings, so that it was likely to be more significant in some countries than in others, and that in general the policy had been successful where employed. But he also remarked that the granting of powers of self-government to the inhabitants of the cities had set in motion forces which were ultimately to weaken the authority of the kings through

creating an environment within which the forces of economic development could, for the first time, be effectively released. In Smith's own words:

> order and good government, and along with them, the liberty and security of individuals, were, in this manner, established in cities, at a time when the occupiers of land . . . were exposed to every sort of violence. But men in this defenceless state naturally content themselves with their necessary subsistence; because to acquire more might only tempt the injustice of their oppressors. On the contrary, when they are secure of enjoying the fruits of their industry, they naturally exert it to better their condition, and to acquire not only the necessaries, but the conveniences and elegancies of life (III, iii, 12).

Now Smith clearly recognised that growth was limited by the size of the market and therefore that since the agrarian sector was relatively backward the main stimulus to economic growth would have to come from foreign trade, a process of development which made it possible for a city to 'grow up to great wealth and splendor, while not only the country in its neighbourhood, but all those to which it traded, were in poverty and wretchedness' (III, iii, 13).

In the next stage of the analysis, however, it was argued that the situation as outlined was unlikely to continue indefinitely, that the development of manufactures and trade within the cities was bound to *impinge* on the agrarian sector and, ultimately, to destroy the service relationships which still subsisted within it. Essentially, this process may be seen to stem from the fact that the development of trade and manufactures had given the proprietors a means of expending their wealth other than on the maintenance of dependants. The development of commerce and manufactures, in short, had

> gradually furnished the great proprietors with something for which they could exchange the whole surplus produce of their lands, and which they could consume themselves without sharing it either with tenants or retainers. All for ourselves, and nothing for other people, seems, in every

age of the world, to have been the vile maxim of the masters of mankind (III, iv, 10).

This situation generated two results. First, since the proprietor's object was now to increase his command over the *means of exchange*, it would be in his interest to *reduce* the number of *retainers*.

Second, since the object was now to maximise the disposable surplus, it would be in the proprietor's interest to change the forms of leasehold in order to encourage output and increase his returns. In this way Smith traced the gradual change from the use of slave labour on the land to the origin of the 'metayer' system where the tenant had limited property rights, until the whole process finally resulted in the appearance of so-called farmers 'who cultivated the land with their own stock, paying a rent certain to the landlord' (III, ii, 14).

It was as a result of these two general trends that the great proprietors gradually lost their powers, both judicial and military, until a situation was reached where 'they became as insignificant as any substantial burgher or tradesman in a city. A regular government was established in the country as well as in the city, nobody having sufficient power to disturb its operations in the one, any more than in the other' (III, iv, 15). And this was a necessary precondition for the emergence of the fourth or commercial stage, as outlined above, and a classic illustration of the 'functionalist' thesis:

> A revolution of the greatest importance to the publick happiness, was in this manner brought about by two different orders of people, who had not the least intention to serve the publick. To gratify the most childish vanity was the sole motive of the great proprietors. The merchants and artificers, much less ridiculous, acted merely from a veiw to their own interest, and in pursuit of their own pedlar principle of turning a penny wherever a penny was to be got. Neither of them had either knowledge or foresight of that great revolution which the folly of the one, and the industry of the other, was gradually bringing about (III, iv, 17).[14]

SECTION 3

The previous argument has been designed to suggest that we may usefully distinguish between Smith's statement of the 'four-stages' theory and his analysis of the actual trend of historical events. Looked at in this way the two parts of the argument are basically distinct, yet clearly interdependent in that the stadial thesis provides us with a set of socio-economic categories which inform the historical work, while the latter provides some explanation of the process of transition between them. I have also sought to suggest that Book III of *Wealth of Nations* is of critical importance as an exercise in *historical theory*, while providing a useful account of the third and fourth stages, of a kind which complements the analysis of Book V of *Wealth of Nations* — even though the references to the four stages are less explicit than in the latter place.

At the same time, it will be apparent that the historical theory as contained in both the *Lectures on Jurisprudence* and *Wealth of Nations* brings us to a point at which it becomes possible to assess the claim that Smith may be regarded as an economic determinist in this field.

There is of course no doubt that Smith's use of the stages draws attention, in a particularly dramatic way, to the importance of modes of subsistence and the relationship which they may bear to the forms assumed by social and legal institutions. As Professor McCormick (1980) has recently pointed out with regard to the stadial thesis, the general approach

> does seem . . . to have a certain intrinsic plausibility in broad terms if not in details. It brings sharply to our attention the way in which laws and legal institutions are an inherent part of the economy of a society and must be understood and explained as such if we wish to proceed beyond purely formal and structural analysis of legal systems considered in the abstract.

Nor can there be much doubt as to the importance of broadly economic forces in the interpretation of actual historical events — a proposition which is nowhere more obvious

than in Smith's analysis of the breakdown of the feudal state and the role ascribed therein to the development of trade and manufactures. It is particularly interesting to observe in this context that Smith would appear to side with Paul Sweezy, and against Maurice Dobb, in suggesting that the feudal state had failed as a result of exogenous rather than endogenous pressures.[15]

Yet even here it is evident that the economic interpretation of events is open to serious qualification. For example, it would appear that certain important changes, such as the emergence of the feudal system (as contrasted with the allodial) and the development of cities, depended almost entirely on self-interested responses to political situations[16] — and that the analysis of the way in which the quantitative development of productive forces generated qualitative changes in the social structure was largely confined to the transition from feudalism to the stage of commerce. Even here it must also be observed that while the attainment of the fourth stage made possible the development of productive forces on a hitherto unimaginable scale, the motivation involved was not necessarily materialistic,[17] a point which may be amply illustrated by reference to the complex psychology of the *Theory of Moral Sentiments*:

> For to what purpose is all the toil and bustle of this world? What is the end of avarice and ambition, of the pursuit of wealth, of power, and preheminence [*sic*]? Is it to supply the necessities of nature? The wages of the meanest labourer can supply them . . . From whence, then, arises that emulation which runs through all the different ranks of men, and what are the advantages which we propose by that great purpose of human life which we call bettering our condition? To be observed, to be attended to, to be taken notice of with sympathy, complacency, and approbation, are all the advantages which we can propose to derive from it. It is the vanity, not the ease, or the pleasure, which interests us. But vanity is always founded upon the belief of our being the object of attention and approbation (I, iii, 2, 1).[18]

Moreover, the situation becomes even more complex when we stop to consider exactly what the 'great revolution' above referred to actually involved. As Smith presents the case, the revolution which was featured in the transition from feudalism to commerce involved an important change in the mode of subsistence which brought with it a further change in the patterns of authority and dependence. Elimination of the relationship of direct dependence, which had been the feature of the feudal state (in Smith's view), had generated a title to personal liberty — although he was far from claiming that the title would necessarily be respected, that the form and structure of political institutions would be the same for all societies which had attained the commercial stage, or that 'states' which had made this advance would share a common 'constitution'.

As we have seen, both Greece and Rome could be said to have attained at least a version of the fourth stage, 'tho not, as now, particularly studied and a theory laid down' (*Lectures on Jurisprudence* (A), iv, 93), while at the same time demonstrating marked cultural and political differences. To approach more nearly to modern times, Smith also observed that while the institutions of the fourth stage had been attained in Germany, unlike some other European examples, the great proprietors had not lost their pre-eminent position, due in part to the size of the country and the sheer extent of the estates which they held (*Lectures* (A), iv, 166). In the same vein, Smith pointed out that absolutist government, as found in France and Spain, was perfectly consistent with an economic situation which corresponded to the stage of commerce. He also observed that freedom under the law was quite compatible with this particular constitutional outcome, while recognising that actual practice would vary.[19] As he said, the government of France, 'though arbitrary and violent in comparison with that of Great Britain, is legal and free in comparison with those of Spain and Portugal' (*Wealth of Nations*, IV, vii, b, 52).

Indeed, England remained for Smith something of a special case in that she *alone* had escaped from absolutism, due, in part, to her natural economic advantages together with other,

non-economic, factors. In this connection, Smith argued that
the solution to the Scottish problem, allied to Britain's posi-
tion as an island, had obviated the need for a standing army,
and thus denied her kings an important (potential) instrument
of oppression. He also observed that particular monarchs had
behaved in highly idiosyncratic ways, citing the example of
Elizabeth I, who had contributed to the weakened position
of her successors by selling off Crown lands – a policy not
unconnected with the accidental circumstance that she had
no direct heir.

As all of this suggests, Smith gave due weight to the impor-
tance of economic factors, but also to the role played by
political considerations, quirks of character, physical elements
and pure accident – points which make it easy to describe
the characteristics of the fourth economic stage but virtually
impossible to predict the *social* 'constitution' of the state or
its political 'superstructure'.[20]

But at the same time Smith plainly had certain *preferences*,
many of which were clearly based on the particular historical
outcome which *had* emerged in Great Britain: namely, that
'system of liberty' which had been 'perfected by the revolu-
tion' of the seventeenth century and which was in part con-
firmed by the independent status of her judges,[21] habeas
corpus, independent juries, the organisation of the courts,
and by the presence of 'an assembly of the representatives of
the people who claim the sole right of imposing taxes' (*Wealth
of Nations*, IV, vii, b, 51).[22]

Now this identification of a *preferred* form of government,
which also happens to maximise the possibilities for economic
growth,[23] lends a further dimension of difficulty to the anal-
ysis, in that once the origin and nature of the fourth stage is
understood it then becomes possible consciously to *imple-
ment* certain policies regarding its shape and the functions of
government.[24] For example, the very nature of the commer-
cial stage, allied to the complexity of modern warfare, had
led, Smith suggested, to a situation where the 'wisdom of the
state' (*Wealth of Nations*, V, i, a, 14) must be called upon.
Smith's preference was for a standing army rather than a
militia, provided that 'the sovereign is himself the general,
and the principal nobility and gentry of the country the chief

officers' (V, i, a, 41). Similarly, he argued that the 'judicial should be separated from the executive power' and indeed that 'it should be rendered as much as possible independent of that power' (V, i, b, 25), before going on to suggest that the provision of judicial services should be organised in such a way as to induce efficiency. The same basic principle is invoked in the discussion of the provision of public works, and continued in the treatment of education, where Smith adds a further dimension in recommending that the state should *impose* certain minimum standards upon the lower and higher ranks of society as a means of offsetting the social consequences of the division of labour. As is now well known, the list of government functions also extends into the more purely economic sphere.[25]

The analogy of the 'invisible hand' is hardly called in question once allowance is made for conscious intervention of the types mentioned, though the situation is immensely complicated by the fact that current policies must now be seen themselves to be instruments of change.[26]

Here again Smith noted that the 'legislator'[27] must expect to confront the 'confirmed habits and prejudices' of the people and to

> remedy as well as he can, the inconveniences which may flow from the want of those regulations which the people are averse to submit to. When he cannot establish the right, he will not disdain to ameliorate the wrong; but like Solon, when he cannot establish the best system of laws, he will endeavour to establish the best that the people can bear (*Theory of Moral Sentiments*, VI, ii, 2, 16).[28]

Moreover, we must recall that Smith's legislator was not, like Steuart's statesman, an abstraction akin to the supposition of 'a point, a straight line, or an infinite, in treating of geometry' (Steuart, 1805, p. 16n) but rather a government which could assume any one of a number of shapes and which would operate in a particular institutional setting. As Smith saw, this fact introduces a further set of constraints and pressures, arising from the fact that the pursuit of political office is itself an object of competition and ambition, that some govern-

ments, notable 'free' ones, are peculiarly sensitive to public opinion, and that some types, notably the British model, are inevitably subject to strong pressure from mercantile interests — with consequent effects on the nature of the legislation passed, and therefore on the direction of subsequent developments.

Taken complexly, as Smith would say, materials such as those reviewed in this section suggest that he was neither determinist nor materialist in his interpretation of *history*, thus implying that Meek's position is open to serious and inescapable criticism, at least from this point of view.

Yet several points should be noticed by way of qualification. First, Meek's preoccupation was with the stadial analysis itself rather than its historical application, a point which is nowhere more obvious than in his relative neglect of Book III of *Wealth of Nations*: such applications remained, as it were, on the *agenda*, and the questions thus posed unanswered.

Second, it should be noted that the 1954 article provides an interesting sidelight on the way in which the question might have been answered had time allowed. Even in the case of Millar, now widely regarded as the most explicit theorist of the *genre*, the reader was reminded of the fact that parallels with Marx are very limited: that despite the former's use of a materialist conception of history, he had no 'feeling for the dialectic of social change', and implicitly denied 'that the labour—capitalist relationship was based upon exploitation'. In the same way Meek drew attention to Millar's recognition of the role played by 'accidental causes' which 'contributed to accelerate, or to retard . . . advancement in different countries' and to the point that 'a variety of peculiar institutions will sometimes take their origin from the casual interposition of particular persons, who happen to be placed at the head of a community, and to be possessed of singular abilities, and views of policy' (Meek, 1954, p. 41).

Third, we should recall the distinction between the stadial thesis and the claim that its presence amounts to *a* if not *the* materialist conception of history — a distinction which allows writers, like Winch, Haakonsen and John Robertson, who are highly critical of the latter thesis, to recognise the importance

of the former at least in the restricted context suggested by the *Ignoble Savage*.

Moreover, it now appears that the stadial thesis has recently been taken up by some of those commentators who seek, rather ironically, to explain the origins of the Scottish Enlightenment in terms of more purely *ideological* considerations. Nicholas Phillipson (1973, p. 146), for example, has recently argued that great weight should be placed on the 'social effects of the Anglo–Scottish Union on one particular section of the Scottish landed class and upon those ideological needs it called upon a literati to satisfy'.[29] Dr Phillipson believes that the literati of the time (including Smith) were imbued with a real 'sense of urgency' and were 'deeply preoccupied with the role of public men in a modern society and with the possibilities of improving its politics, economy, manners, and literature' (Phillipson, 1976, p. 112). Dr Phillipson does not emphasise the importance of the four stages so much as the significance of the age of commerce, but the perspective he adopts is not inconsistent with that thesis.

Somewhat in the same vein John Robertson (1982) has argued that in the post-Union period a main preoccupation of people like Smith was to explain the relationship between institutions and economic development which had been the subject of debate in Scotland for some three-quarters of a century, and claimed that it was to the analytical clarification and resolution of the problem of institutions that Smith particularly applied the stadial model. While Robertson asserts, quite correctly, that in Smith's work the 'economic base does not straightforwardly and reductively determine the institutional superstructure', none the less the 'well known' account of the four stages figures largely in his argument – and the authority quoted is that of Meek. The same is true of the most authoritative commentator in this field, John Pocock, who has sought to explain the reaction of eighteenth-century writers to the realisation that modern institutions had made it impossible for people to attain the ideals of classical citizenship, namely direct involvement in government and a wide range of civic activities (see esp. Pocock, 1972, ch. 3). The response is shown to have been a positive one, in that it

sought to adapt to existing institutions in the clear realisation that the processes of history could not be reversed:

> The secret of the four stages lies less in any logic which determined that hunter, shepherd and farmer *must* succeed one another in that order than in the pioneer historical materialism which suggested that as men and women acquired control over property and production that their passions and capacities became those of human and social beings. It is at this point that the ideology produced to defend mercantile modes of government visibly becomes what in Marxist vocabulary is known as bourgeois ideology (Pocock, 1979).[30]

A wide and increasing range of writers, it would seem, few of whom have been motivated by Marxist (or Meekist) pre-occupations, now clearly recognise the importance of Meek's work in this field, and have come to appreciate his belief in the importance of the four stages.

It is also true that writers who may question not so much the 'stadial' thesis as the 'determinist' theory of history none the less recognise the importance of the historical *dimension* which Meek thus brought to modern studies of Smith as an *economist*. Few, surely, would dispute the point that Smith's sociological and historical work is remarkable for the weight of emphasis placed on economic forces, or disagree with Donald Winch's (1979b) judgement that the real virtue

> of Ronald Meek's interpretation is that it makes a genuine attempt to encompass the historical dimension of Smith's work — something which was remarked on extensively by Smith's contemporaries, and which has always been treated with respect by students of the Scottish Enlightenment, even though most economists have either ignored or dismissed it as a mere digression from the main analytical themes.[31]

In the same way it must be recognised that Meek's understanding of the socio-historical works of the *eighteenth* century enabled him to demonstrate that *economics* as a discipline

had been gradually divorced in the nineteenth century from its original (*Smithian*) setting, and that it was Marx who 'saw the vital connections which had been forgotten, and restored the unity that had been destroyed'. In this sense Meek's instinct was fundamentally correct when he wrote that

> Smith, like Marx, was a whole man, who tried to combine a theory of history, a theory of ethics, and a theory of political economy into one great theoretical system . . . there is no doubt that Marx can properly be said to be the heir of the basic ideas of the Scottish Historical School (Meek, 1954, p. 50).

While sentiments of this kind are now commonplace, at least among students of Smith's economics, it is easy to forget the weight of scholarly research which was needed to introduce them, and perhaps to lose sight of the point that it was a 'fierce young Marxist' who was largely responsible for reminding us of their value.

NOTES TO CHAPTER 2

1. It is appropriate to point out that writers such as Bryson tended quite properly to regard the *Theory of Moral Sentiments* as amongst the more important of Smith's 'sociological works'.
2. See especially Lehmann (1960).
3. See in particular the section entitled 'Sociological evolution before and after Darwin'. Also Burrow (1966) and Chitnis (1976).
4. The passages are quoted by Pascal (1938, p. 177) and by Meek (1954, pp. 37—8).
5. Meek (1974) in MacPherson (1974). This collection contains an interesting reply to Meek's claims by Cumming (1974).
6. The material is mainly contained in the chapter entitled 'The four stages and its pre-history'.
7. See especially ch. 2: 'In the beginning all the world was America' and cf. Donald Winch (1979a), a paper given to the conference of the Canadian Society for Eighteenth Century Studies, Vancouver, 1979. Professor Winch attended this conference in place of Meek and his paper is the record of a mild disagreement. At the same time, Professor Winch recognised that 'It has largely been as a result of Ronald Meek's writings that what he called the "theory of four

stages", expounded in Smith's *Lectures*, has come to play such an important part in the interpretations of eighteenth-century social theory in both Scotland and France'.

8. See Meek (1976a, chs 3 and 4), dealing with the French and Scottish 'Pioneers of the 1750s'.

9. This paper is really only one side of an amiable disagreement over matters of emphasis which developed over some twenty years. Meek in fact never lectured on these materials to undergraduates, so that it was only at that point when he acted as my supervisor that I first became acquainted with the 'stadial' thesis and then stumbled across related, if not exactly similar, ideas in the works of Sir James Steuart. Working as a lecturer in political theory shortly thereafter, the work of the Scottish School appeared doubly intriguing in that it seemed to represent an opportunity, in teaching, to widen the discussion of the 'rediscovery of the community' in terms of eighteenth-century thought and, at the same time, to provide a useful perspective on Marx — not least by showing the extent to which a broadly 'materialist' view could be developed by writers who were clearly not Marxists. This was very much the intention behind Skinner (1965), an article which Meek was kind enough to approve and which marked, and marks, some considerable community of interest. Thereafter, our emphases diverged, with the present writer becoming more interested in the 'qualifications' to the determinist interpretation, while Meek tended to forgo the more general perspective of his 1954 article in favour of an increasing preoccupation with the four-stages theory as such. While recording here some differences of emphasis, important as I think they are, I am unwilling to make too much of them. Meek usually pursued ideas vigorously and to their logical conclusion — and always showed himself willing to change opinions once the focus of his attention had changed, as readers of his *Studies in the Labour Theory of Value* (1956, revised edition, 1973) to take one example, will be aware. Work on our joint article, Meek and Skinner (1973), allows me to attest this quality in connection with an issue which Meek regarded as important — the dating of the 'fragments' on the division of labour. The article was originally published in the *Economic Journal*, vol. 83 (1973), and appears in different forms, and by mutual agreement, in Meek (1977) and Skinner (1979).

10. The statement occurs in the opening passages of Meek (1971) as printed in *History of Political Economy*. It was omitted from the version published in Meek (1977).

11. The account of the four stages follows the argument of my essay on 'Historical theory' as printed in Skinner (1979). The references

conform to the usages of the Glasgow edition of the *Works and Correspondence of Adam Smith*. I am grateful to the Oxford University Press for permission to republish a number of passages.

12. There is an excellent account of the question of political obligation in Lindgren (1973, ch. 4).

13. The notes to Book III of the Glasgow edition of the *Wealth of Nations* seek to explore the relationship between this book and relevant parts of the *Lectures*, both in general and in particular. This was, in part, the consequence of a recommendation of the Editorial Board that references should be provided from later to earlier works, rather than vice versa. The decision also explains the nature of the apparatus provided in *Wealth of Nations* and the absence of a similar system of references to *Wealth of Nations* in the Glasgow edition of the *Lectures*.

14. The first printing of the Glasgow edition of the *Wealth of Nations* has 'out' for 'about' in the first sentence of this quotation. The error was corrected in the subsequent reprint (1979).

15. There is a particularly interesting discussion of these issues in Letwin (1977).

16. See especially Winch (1978, pp. 76–80).

17. The distinction between materialism and determinism is developed in a striking way by Haakonsen (1978). I am indebted to Dr Haakonsen for a most helpful correspondence, and to Donald Winch for drawing my attention to a distinguished thesis in its completed form. The references to Smith occur in section 16 of Haakonsen's thesis.

18. In this connection see Lamb (1974).

19. The point has been developed extensively by Duncan Forbes (1975, pp. 185, 189, 191–2). The point was neatly put by Sir James Steuart (1805, p. 211):

> If we reason from facts, and from experience, we shall find that trade and industry have been found to flourish best under the republican form, and under those which have come nearest to it. May I be allowed to say, that perhaps one principal reason for this has been that under these forms the administration of the laws has been the most uniform, and consequently, that most liberty has *actually* been there enjoyed: I say actually, because . . . liberty is equally compatible with monarchy as with democracy; I do not say that the enjoyment of it is equally equally secure under both.

20. As Haakonsen (1978, p. 213) has suggested, Smith seems to operate within the extremes of 'determinism and indeterminism in history',

thus producing a perspective which is much more accurately described as 'pluralistic'. For related reasons, I believe that Meek's description of William Robertson's use of the stadial thesis in relation to the study of history is equally accurate with regard to Smith, in that his

> use of the four stages theory was by no means dogmatic or mechanical: his intention throughout was to use it, not as a substitute for the facts, but rather as an organisational framework within which the facts could usefully be set. He would not have subscribed to the notion that society naturally and necessarily proceeded from hunting to pasturage and then from pasturage to agriculture, being impelled on this course by unavoidable endogenous causes. (Meek, 1976a, p. 144).

Similarly, I would suggest that Meek's description of Joseph Barnave as one who reconciled the stadial analysis with the 'economic and political history of the rise of commerce in modern Europe' (1976a, p. 228) is directly applicable to Smith. Interestingly enough, Meek recognised, in making the latter statement, that he had not been really 'fair to men like Smith and Millar' (1976a, p. 229).

21. The legal basis of English liberties is reviewed extensively in the opening sections of *Lectures on Jurisprudence* (A), v.

22. Smith's preferences with regard to political organisation are developed particularly in the discussion of the American colonies. See, for example, *Wealth of Nations* (IV, vii, b, 51ff).

23. This theme is developed by Billet (1975) and West (1976). The theme is a major feature of an article written by John Robertson of St Hugh's College, Oxford. A major theme of this attractive argument is the contention that Smith's model 'suggests that the rational, economic and free ordering of institutions will come about only as a result of conscious choice. Far from being guaranteed by any invisible hand, the harmonisation of economy and polity in commercial society is, Smith believed, the task of the legislator.' The article, entitled 'The Scottish Enlightenment at the limits of the civic tradition', is to be published in *Wealth and Virtue*, ed. I. Hart and M. Ignatieff (Cambridge University Press, 1982).

24. The present writer's views as to the functions of government in Smith's work are set out in Skinner (1979, ch. 9).

25. Smith's argument that outmoded institutions, together with positions of established privilege, would have to be deliberately dismantled if the system of 'natural liberty' was to be realised is a useful reminder that the fourth economic stage is a necessary but

not a sufficient condition for the realisation of that 'system'. See Skinner (1979, pp. 216—19).

26. McCormick (1980) offers an interesting variation on this in stating that:

> Smith's overall position seems to me to be in principle a self-consistent one. The more we know and understand our own circumstances, the more we can make genuinely rational choices guided by a well-founded view of individual or of collective interests. Therefore we ought to seek to understand our circumstances as well as possible, and ought to make those choices which seem most sensible given our necessarily imperfect, but always improvable, understanding of those circumstances. That Smith does not venture any predictions as to what will happen beyond commercial society is a strength rather than a weakness of his approach, since our capacity to foresee the unintended outcomes of what we now do for reasons which are or seem good given our limited understanding is in practice and in principle bound to be imperfect. I would venture to suggest that it is a weakness and not a strength of Marx's that he observed no such modesty in his pretended capacity to foresee the future.

27. The role of the 'legislator' is particularly emphasised by Winch (1978, pp. 12—13, 159—60, 170—3, 181).
28. See Skinner (1979, pp. 228ff).
29. See also Phillipson (1970).
30. I am indebted to Professor Pocock and to Donald Winch for guidance in respect of this literature.
31. Winch points out that his (1979b) paper is based 'on an extension' of Winch (1978).

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CHAPTER THREE

Marx on Ricardo

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To compare Ronald Meek's long Introduction to the second edition of his *Studies in the Labour Theory of Value* (1973) with the unchanged original text (1956) is to see at once how greatly the discussion of Marx's economics has changed over the last quarter of a century. For both intrinsic and extraneous reasons, the debates during this recent period of changed emphases have often touched on the relations — of similarity and of contrast — between Marx's economics and that of Ricardo. The purpose of the present essay is to contribute to the clarification of those relations by drawing attention to a number of issues on which Marx's mature criticisms of Ricardo appear to have been less than fully justified and on which the differences between Ricardo and Marx have, perhaps as a result, been somewhat exaggerated. Since the matters at hand seem to prompt some discussants to ringing declarations, rather than to close study of the texts, I should perhaps emphasise that the essay does not attempt an over-all assessment of the relation of Marx to Ricardo, does not argue that Ricardo was always right and Marx always wrong, does not imply that Marx was merely a Ricardian economist, etc., etc. In brief, the reader is asked not to read into what follows more than is really there.

   One of our principal sources for Marx's views on Ricardo is, of course, the second part of *Theories of Surplus Value* (written in 1861—3) and frequent reference will be made to this text below. It is therefore important to bear in mind throughout that the manuscripts published in the *Theories of Surplus Value* were Marx's working notes and, like so much

of his work, were never prepared by him for publication. We can never know how Marx might have changed them for publication and can thus only use the version we have, but it is always possible that the result is somewhat 'unfair' to Marx: how many authors have never made a statement in working notes which they would not retain in any published version? It is also to be noted, in similar vein, that many of Ricardo's writings, to which we now have access, were not available to Marx and necessarily had no influence on his assessment of Ricardo's work.

1   VALUES, PRICES AND PROFITS

We may consider first a number of closely interrelated issues concerning Ricardo's treatment of prices and profits. Marx's criticism of Ricardo for identifying prices and values will be examined, as will the criticism that Ricardo 'assumed the rate of profit from the outset, rather than developing it from the concept of value'. Attention will then be turned to the question whether the 'luxury' sector influences the rate of profit and to the (closely related) charges that Ricardo ignored constant capital, confused the rate of profit with the rate of surplus value and wrongly followed Smith in attempting to resolve the prices of commodities into wages and profits. The fixed/circulating and constant/variable capital distinctions will also be considered.

PRICES AND VALUES

In the first chapter of his *Principles*,[2] entitled 'On Value', it is clear that Ricardo does *not* use the term 'value' to mean either the amount of labour required for the production of a commodity or that amount of labour divided by the corresponding amount for a unit of gold, the money commodity. Thus the very first words of that chapter, the heading to section I, read 'The value of a commodity, or the quantity of any other commodity for which it will exchange' (*Principles*, p. 11), while on the following page Ricardo says of scarce commodities that 'Their value is wholly independent of the

quantity of labour originally necessary to produce them' (ibid, p. 12). Again, on page 34 Ricardo refers to commodities requiring the same annual labour for their production but having different values, and on pages 36–7 and 45 he states that the values of commodities depend on the level of wages, *as well as* on the quantities of labour required for their production. On the contrary, Ricardo uses the term 'value' to mean the same as both cost of production, including profits, and natural price. Thus he writes 'Mr Malthus appears to think that it is a part of my doctrine, that the cost and value of a thing should be the same — it is, if he means by cost, "cost of production" including profits' (p. 47n*). And he concludes the chapter 'On Natural and Market Price' by saying 'In speaking then of the exchangeable value of commodities, or the power of purchasing possessed by any one commodity, I mean always that power which it would possess, if not disturbed by any temporary or accidental cause, and which is its natural price' (p. 92). (Reference back to the heading of chapter I, section I will show that Ricardo is here referring to 'the value of a commodity'.) Indeed, in his *Notes on Malthus* (which was not available to Marx), Ricardo expressly *identified* all three terms: 'If by cost Mr Malthus means cost of production, he must include profits, as well as labour; he must mean what Adam Smith calls natural price, which is synonymous with value' (pp. 34–5). For Ricardo, then, the terms value, cost of production and natural price were simply synonyms, all meaning what Marx was later to call 'cost price', in *Theories of Surplus Value*, or 'price of production' in volume III of *Capital*.[3] (Cf. Marx's statement in *Capital* (III, p. 198) that his price of production is 'what Adam Smith calls *natural price*, Ricardo calls *price of production*, or *cost of production*, and the physiocrats call *prix nécessaire*'.)

It is next important to note that Ricardo's purpose in chapter I, section III, and in chapter II of his *Principles* was to show that, contrary to the argument of Adam Smith, 'the accumulation of stock and the appropriation of land' — i.e. the existence of profit and of rent — did not *necessarily* prevent the values of commodities from being proportional to the respective quantities of labour required, directly and indirectly, for their production. As will emerge below, it is

perhaps significant for our purposes that Ricardo's objective
in these sections of his *Principles* was less clearly stated in the
third edition of 1821 than in the second edition of 1819.
Thus, in this latter edition, section I was headed 'The value of
a commodity . . . depends on the relative quantity of labour
which is necessary for its production' (just as in the third
edition), while section II (which corresponds to section III of
the third edition) was headed 'The accumulation of capital
makes no difference in the principle stated in the last section'
(*Principles*, p. 22, n. 2). Section II of the second edition then
started with two paragraphs – included in the first but ex-
cluded from the third edition – in which Ricardo stated
explicitly that his concern was to question whether profits
and rents necessarily make relative values different from rela-
tive quantities of embodied labour (ibid, p. 22, n. 3). He then
argued in that section that profits do not necessarily have
that effect and in chapter II that rents do not influence
values.[4] (It is also of interest to note here that in a letter, to
Mill, of 28 December 1818 – between the first and second
editions – Ricardo again explains most explicitly his opposi-
tion to Smith's idea that accumulation *per se* means that
quantities of labour time do not regulate values: *Works*, VII,
p. 377.)

In the immediately following sections (III and IV of the
second edition; IV and V of the third edition) Ricardo then
went on to recognise, quite consistently, that while values
could be proportional to labour quantities even in the pres-
ence of positive profits, they generally would not be, due to
the different 'time structures' of the capitals used in the pro-
duction and the bringing to market of different commodities.
Ricardo generally draws attention to this fact by writing of
the *change* in relative values corresponding to a *change* in
wages (and profits), but in view of his purpose in section III
(II of edition 2), explained above, it is perfectly clear that for
Ricardo this was but another way of saying that, in general,
values are not proportional to labour quantities when profits
are positive. And indeed in the penultimate paragraph of
section V (edition 3) Ricardo seems to run together the two
modes of expression; he says, for example, that 'Since goods
which sell for 5000l. may be the produce of a capital equal in

amount to that from which are produced other goods which sell for 10,000l., the profits on their manufacture will be the same; but those profits would be unequal, if the prices of the goods did not vary with a rise or fall in the rate of profits' (pp. 42–3). Again, on pages 34 and 37 Ricardo's emphasis is on 'difference' and *not* on 'change'.

We may now turn to consider Marx's discussion of Ricardo's treatment of the above-mentioned issues, principally that given in chapter X of *TSV*, II, entitled 'Ricardo's and Adam Smith's theory of cost—price (refutation)'. Over and over again Marx (a) criticises Ricardo for identifying values and cost prices, and (b) asserts that while Ricardo examined the *changes* in relative cost prices resulting from a *change* in wages and profits, he failed to see that the mere existence of a positive uniform rate of profit sufficed to make relative cost prices different from relative 'values'. Among the many, and very repetitive, passages to this effect, are the following:

> if these capitals because of their equal size are to yield equal profits, then the *prices of commodities* . . . must be very different from the *values of the commodities* . . . It is all the more surprising that Ricardo did not arrive at this conclusion (*TSV*, II, p. 198).

> the error [Ricardo] committed already in Chapter I '*On Value*', where he identified cost-price and value (ibid, p. 208).

> Ricardo on the contrary assumes the identity of values and cost-prices (ibid, p. 434).

> But [Ricardo's] identification of *values* of commodities with the *cost prices of commodities* is fundamentally false (letter to Engels, 2 August 1862).

> If Ricardo had gone into this more deeply, he would have found that — owing to the [inter-commodity differences in the time structure of capital] — the mere existence of a *general rate of profit* necessitates *cost-prices* that differ from *values*. He would have found that, even if *wages* are assumed to *remain constant*, the difference exists and

therefore is *quite independent* of the rise or fall of wages (*TSV*, II, pp. 175–6).

But it is incorrect to say, as Ricardo does, that here a variation in the relative values takes place 'on account of the different degrees of durability of capitals'. . . or 'on account of the time which must elapse before one set of commodities can be brought to market' . . . It is, rather, the adoption of a *general rate of profit*, which . . . gives rise to equal *cost-prices* which are *different* from values, for values are determined only by labour-time' (ibid, p. 187).

Ricardo *does not dwell on the conclusion which follows from his own illustrations* [in sections IV, V], namely that — *quite apart* from the rise or fall of wages — on the assumption of constant wages, the cost-prices of commodities must differ from their values, if cost-prices are determined by the same percentage of profit' (ibid, p. 191).

Similar passages may be found in *TSV* (II, pp. 132, 174–5, 180–1, 182, 190, 190–1, 192, 195–6, 418); but it will suffice here to note that Marx concludes his main discussion of these issues by actually quoting Ricardo's reply to Malthus (*Principles*, p. 47n*, quoted above), in which 'value' and 'cost of production' are said to be synonyms, and then remarking, 'With this erroneous confusion of cost-prices and values, which [Ricardo] has himself refuted, he then proceeds to consider rent' (p. 199).

The first thing to notice about Marx's criticisms of Ricardo is that they persistently turn on a mere verbal muddle on Marx's part. He is using the term 'value' to mean either the amount of labour required for the production of a commodity *or*, more usually, the ratio of that amount of labour to the corresponding amount for a unit of gold, the money commodity. This latter ratio is, of course, equal to the gold price of the commodity which *would* obtain *if* profits were zero. In this usage, it is of course perfectly acceptable to say that, in general, when profits are positive, the cost prices of commodities, measured in gold, will differ from their 'values'. But when Ricardo identified values and costs of production, or cost prices, he was simply not using the term value in the

same way as Marx. Or, to put the same point differently, Marx persistently misinterprets Ricardo's use of the term value to be his (Marx's) use and then accuses Ricardo of 'mistakenly' identifying value and cost — terms which for Ricardo were simply synonyms! Marx's 'criticism' of Ricardo for identifying values and cost prices is just a verbal insensitivity on Marx's part.[5]

Of greater interest is Marx's charge that Ricardo — even though he discussed the effects of wage changes on relative natural prices — failed to see the more general point that, with positive profits, relative natural prices will differ from relative embodied labour quantities. It is at this point that our earlier discussion of the differences between the second and third editions of the *Principles*, concerning Ricardo's relation to Adam Smith, becomes relevant. It was pointed out there that it was far more clear in the second edition than in the third that Ricardo *first* argued, against Adam Smith, that positive profits do not necessarily cause relative natural prices to diverge from relative quantities of labour, and *then* showed why they will do so when time structures of capital differ as between commodities. Now it would seem that Marx studied *only the third* edition of Ricardo's *Principles*: all Marx's references to the *Principles* in *TSV* (II, ch. X) are to that edition. And on page 167 he writes, 'Chapter I is *"On Value"*. It is subdivided into seven sections.' But this statement about the subdivision is true *only* of the third edition; in the first edition, chapter I was undivided, while in the second it was divided into just five sections. It would thus seem plausible to assume that Marx was familiar only with the third edition and not with the second in which the structure of Ricardo's argument, concerning the effect of profits on relative natural prices, was made more clear. This may help to explain why Marx made so much of the allegation that Ricardo saw only the effects on relative natural prices of *changes* in wages and profits but did not see that the existence of positive profits would, in general, cause those prices to differ from relative quantities of embodied labour. (On the other hand, of course, it does nothing to excuse Marx for not noting those passages where Ricardo does refer to 'difference' rather than 'change', or to alter the simple logical point that

since, in Marx's terminology, cost prices do equal values with zero profits, the statement that cost prices change as distribution changes entails that cost prices differ from values when profits are positive. Moreover, on page 168 of *TSV* (II), Marx clearly states the main point of Ricardo's section III. Thus Marx was making a considerable fuss about nothing, whether or not he had the handicap of not having studied the second edition of the *Principles*.)

THE STRUCTURE OF RICARDO'S ARGUMENT

Intimately related to Marx's criticisms of Ricardo discussed in the previous section are his further criticisms directed at the structure of Ricardo's argument and at its presentation. He says of the *Principles*, 'But the faulty architectonics of the theoretical part (the first six chapters) is not accidental, rather it is the result of Ricardo's method of investigation itself and of the definite task which he set himself in his work. It expresses the scientific deficiencies of this method of investigation itself' (*TSV*, II, p. 167).

Marx's criticism here purports to be an internal logical one. As examples of that criticism, consider the following:

[Ricardo's method] leads to erroneous results because it omits some essential links and *directly* seeks to prove the congruity of economic categories with one another' (*TSV*, II, pp. 164–5).

in this first chapter ['On Value'] not only are *commodities* assumed to exist . . . but also wages, capital, profit, the general rate of profit (ibid, p. 168).

[In sections IV and V of chapter I, Ricardo] presupposes a *general rate of profit* . . . Instead of *postulating* this *general rate of profit*, Ricardo should rather have examined in how far its *existence* is in fact consistent with the determination of value by labour-time, and he would have found that instead of being consistent with it, *prima facie*, it *contradicts* it, and that its existence would therefore have to be explained through a number of intermediary stages (ibid, p. 174).

All Ricardo's illustrations [in sections IV and V] only serve him as a means to smuggle in the *presupposition of a general rate of profit* (ibid, p. 190).

Just why Marx regards it as a scientific deficiency that Ricardo supposes a uniform rate of profit even in the first chapter of his *Principles* emerges clearly in the following passages:

> The sum total of these *cost-prices* of all the commodities taken together will *be equal to their value*. Similarly the total profit will be equal to the total surplus value . . . If one did not take the definition of value as the basis, the *average profit*, and therefore also the cost-prices, would be purely imaginary and untenable . . . Without [the determination of value by labour-time] the average profit is the average *of nothing*, pure fancy. And it could then equally well be 1,000 per cent or 10 per cent (*TSV*, II, p. 190).

> Ricardo, instead of deriving the difference between cost-prices and values from the determination of value itself (ibid, p. 191).

> the cost-prices remain unintelligible without values determined by labour-time (ibid, p. 194).

> This vulgar view [that profit is a mere addition over and above the value of the commodity] is bound to arise, if the [uniform rate of profit] is not connected by a series of intermediary links with the general laws of value, etc. . . Accordingly Ricardo has no means for determining a *general rate of profit* (ibid, p. 427).

Before discussing the above criticism of Ricardo, we may note that further relevant passages in *TSV* (II) appear at pages 166, 193, 374 and 433–4, and that Marx maintained that criticism in later years. Thus in his famous letter to L. Kugelmann, of 11 July 1868, he wrote, 'It is precisely Ricardo's mistake that in his first chapter on value he takes *as given* all possible and still to be developed categories in order to prove

their conformity with the law of value', and in *Capital* (III) we read:

> These particular rates of profit . . . in every sphere of production . . . must . . . be deduced out of the values of the commodities. Without such deduction the general rate of profit (and consequently the price of production of commodities) remains a vague and senseless conception (p. 157).

In brief, Marx criticises Ricardo for not explaining the rate of profit in terms of labour-time and, more constructively, for not following his (Marx's) theoretical structure, in which the rate of profit is said to be explained in terms of labour-time — $r = [s/(c + v)]$ — and in which the difference between relative prices of production and relative embodied labour quantities is then explained in turn, again in terms of labour-time. Without such a structure of explanation, Marx asserts, the rate of profit and prices of production remain unintelligible.

Now, with the benefit of hindsight and of the work of Dmitriev, Bortkiewicz and Sraffa, we can see clearly that Marx's criticism of Ricardo on this score was ill-judged. We know, first, that Marx's structure of explanation proved unsuccessful: he was not able to construct a coherent theory of the rate of profit and of prices of production by starting from labour-times, moving on to the rate of profit and then deriving, finally, the cost prices. And we also know, more fundamentally, that Marx's failure in this regard was not, so to speak, a 'personal' failure, a failure to carry through a possible line of theoretical argument. It was Marx's proposed structure of argument *itself* that was inherently flawed. The general rate of profit and the prices of production *must* be determined simultaneously within the theory and Marx's proposed 'linear' structure of argument is a dead end. We can thus say, today, that Marx was quite wrong to criticise Ricardo for presupposing a rate of profit right at the beginning of his argument, quite wrong to say that Ricardo should have followed his (Marx's) later type of argument, and quite wrong to say that Ricardo's approach was inherently incapable of providing a theory of the rate of profit and of natural prices.

(See, for example, sections 4 and 5 of Sraffa's *Production of Commodities*, 1960).

One must, of course, remain fully aware that the above is written from our contemporary standpoint; we cannot be certain whether Ricardo saw the structure of his argument as clearly as we see it today, and we should be even less certain that 'we' would have seen what was wrong with Marx's criticism of Ricardo in, say, 1863. Yet the fact remains that Marx's criticisms of Ricardo on this count were unjustified. Here, just as over the question of 'cost prices' and 'values' discussed in the previous section, Marx's *Theories of Surplus Value* must *not* be treated as a reliable source for the assessment of Ricardo's work. It is rather a source in which we can see Marx working out *his own theories*, while ostensibly discussing the theories of others.

THE 'LUXURY' SECTOR

One important aspect of Ricardo's theory of profit was that the conditions of production of 'luxury' commodities have no influence on the rate of profit. He wrote:

> But suppose the price of silks, velvets, furniture, and any other commodities, not required by the labourer, to rise [in price] in consequence of more labour being expended on them, would not that affect profits? Certainly not: for nothing can affect profits but a rise in wages; silks and velvets are not consumed by the labourer, and therefore cannot raise wages (*Principles*, p. 118).

Commenting on this passage Marx wrote, 'The *rate of profit* in these particular spheres of production would certainly fall . . . And the *general rate of profit* consists of the average of the particular rates of profit in all branches' (*TSV*, II, p. 431), thus rejecting Ricardo's perfectly correct proposition. Interestingly, however, Marx's next two sentences *perhaps* hint, though not unambiguously, at Ricardo's correct position, namely that worsening conditions of production in 'luxury' sectors simply raise the corresponding prices, leaving the rate of profit unaltered.

Be that as it may, Marx elsewhere sticks to his rejection of Ricardo's (perfectly correct) proposition. Thus he writes, 'Even in the case of luxury articles, such improvements can raise the general rate of profit, since the rate of profit in these spheres of production, as in all others, bears a share in the levelling out of all particular rates of profit into the average rate of profit' (ibid, p. 423; see also pp. 379, 385). The same position is maintained in his discussion of Ramsay: 'Increased productivity in the luxury industries . . . can influence the rate of profit' (*TS V*, III, p. 349). And indeed Marx's incorrect view is inherent in his attempt to explain the rate of profit by means of the formula $[s/(c + v)]$, for while s and v depend only upon the (direct and indirect) production conditions of wage goods, c depends on the production conditions for *all* commodities, luxuries included. It is for this reason that Marx's rejection of Ricardo's position is bound up with his charge that Ricardo ignored 'constant capital', c, a charge to be considered in the next section.

(It may be noted that while there is no reason to think that Marx was aware of the point, in the most general joint-production systems it is *not* possible to say that the rate of profit depends only on the real-wage bundle and on the direct and indirect conditions of its production, other production conditions being irrelevant.)[6]

DID RICARDO IGNORE NON-WAGE CAPITAL?

If all production were carried out, within one period, by unassisted labour, paid in advance, then all capital would be wage capital; the rate of profit, the rate of surplus value and the ratio of profits to wages would all coincide; and the price of every commodity would be immediately resolvable into wages and profits.[7] It is for this reason that Marx weaves together the following three criticisms of Ricardo: that he ignores non-wage capital, at least when referring to the economy as a whole; that he identifies the rate of profit with the rate of surplus value; and that he accepts Adam Smith's view that the price of every commodity can ultimately be resolved into revenues. Consider, for example, the following passages:

In his observations on profit and wages, Ricardo also abstracts from the constant part of capital, which is not laid out in wages. He treats the matter as though the entire capital were laid out directly in wages (*TSV*, II, p. 373).

[Ricardo] is, therefore, only right in the *one* case, where the total capital equals the variable capital; a presupposition which pervades all his, and Adam Smith's, observations regarding the capital of society as a whole (ibid, p. 414).

It has been shown that [Ricardo] wrongly identifies surplus-value with profit and that these are only identical in so far as the total capital consists of variable capital or is laid out directly in wages . . . Only in this case can the total product simply be resolved into wages and surplus-value. Ricardo evidently shares Smith's view, that the *total value* of the annual product resolves itself into revenues (ibid, p. 426).

[Ricardo's] 'explanation of the fall in the rate of profits . . . rests on the false assumption that the *rate of surplus-value* and the *rate of profit* are identical (ibid, p. 439).

the absurd dogma pervading political economy since Adam Smith, that in the final analysis the value of commodities resolves itself completely into income, into wages, profit and rent . . . Ricardo nowhere refuted Smith's false analysis of commodity-price . . . He does not bother with it, and accepts its correctness so far in his analysis that he 'abstracts' from the constant portion of the value of commodities (*Capital*, III, p. 841 and footnote).

Many other similar statements concerning these interrelated issues could be cited.[8] But we must rather turn to consider whether Marx's criticisms of Ricardo are justified. In doing so, we must, unfortunately, leave aside the question whether Marx's remarks are correct as against Adam Smith; as already noted, we shall therefore ignore rent. We may also leave until later Marx's double distinction between fixed and circulating capital, on the one hand, and between constant and variable capital, on the other, for all that matters at present is whether Ricardo ignored capital other than wage capital.

Resolution of prices into revenues

It must first be noted that Marx was in error when suggesting that only by ignoring non-wage capital can one conceive of a resolution of commodity prices into wages and profits; indeed, there are at least two alternative ways of conceiving of such a resolution, even in the presence of non-wage capital. We may begin by considering this question in modern terms, it being clearly understood that it is not suggested that this is exactly how Smith or Ricardo or Marx thought about it.

Consider an economy in which every industry produces a single product and uses circulating-capital goods as inputs, but uses no fixed capital. If the gross output of each industry is made equal to unity, by choice of units, commodity prices, p, satisfy the relation:

$$p = (1 + r)w\mathbf{a} + (1 + r)p A \qquad (3.1)$$

where r is the profit rate, w the wage rate, $\mathbf{a}$ the vector of direct labour inputs and A the matrix of commodity inputs. It can scarcely be denied that (3.1) takes account of non-wage capital. Yet we may repeatedly 'self-substitute' for p on the right-hand side of (3.1), to obtain:

$$p = (1 + r)w\mathbf{a} + (1 + r)^2 w\mathbf{a}A + (1 + r)^3 w\mathbf{a}A^2 + \ldots$$
$$+ (1 + r)^n w\mathbf{a}A^{n-1} + (1 + r)^n p A^n \qquad (3.2)$$

On the right-hand side of (3.2) every term but the last represents a certain sum of wages plus a certain sum of profits, while the last term becomes vanishingly small as 'n' increases without limit (provided only that the economy is viable and that wages are positive). Thus (3.2) may properly be said to present a 'resolution' of each commodity price into wages and profits. (Compare the above with *Capital*, II, p. 450.)

Alternatively, we may subtract pA from both sides of (3.1), then post-multiply throughout by $(I - A)^{-1}$ and write:

$$p = w\mathbf{l} + r(w\mathbf{l} + p H) \qquad (3.3)$$

where $\mathbf{l}$ shows the *total* quantities of labour used, directly

and indirectly, in the production of commodities and H is a matrix of direct and indirect use of commodities as produced inputs.[9] Even more directly than (3.2), then, (3.3) presents each commodity price as the sum of the wages earned in its production and the profits obtained in the course of that production. Since (3.3) is merely a way of rewriting (3.1), the former can scarcely be said to involve ignoring non-wage capital! It is not necessary to assert that Adam Smith had written down equation (3.2) and/or equation (3.3) and then, in the spirit of Marshall, consigned his mathematical notes to the flames, before he wrote that 'the whole price still resolves itself either immediately or ultimately into the same [three] parts of [rent], labour, and profit'. It is enough to note that to conceive of prices as resolved into wages and profits is *not, ipso facto*, to ignore non-wage capital.

The fact that the price of each commodity can be resolved into wages and profits means immediately that the value of any commodity bundle can be so resolved, so that Marx's apparent disapproval (*TSV*, II, p. 426, quoted above) of the view that 'the *total value* of the annual product resolves itself into revenues' might seem to be unjustified. But this observation probably fails to do justice to what Marx really had in mind, for he wrote elsewhere that 'Adam Smith baulked at the logical conclusion of his resolution of commodity value . . . into revenue: the conclusion that the total annual product could then be entirely consumed' (*Capital*, II, p. 466). Marx was naturally correct to state that the gross product cannot be consumed (year after year) but he was wrong to present the denial of this truth as a 'logical conclusion' from the resolution of prices into revenues. It is no such thing. On post-multiplying (3.3) by the vector of gross output we simply find that, in modern terminology, for a closed economy using only circulating capital:

Value of gross national product

$\qquad$ = Value of national income + Value of capital (3.4)

The logical conclusion from the price resolution (3.3) is (3.4), which by no means states that the value of the gross product can be consumed (year after year).

The resolution of prices into wages and profits presented in (3.2) *can* be interpreted in terms of a hypothetical time series of 'dated' labour quantities. (However, it must be noted, in passing, that it does not *have* to be so interpreted; (3.1) contains no reference to more than one time period and (3.2) is merely a formal rearrangement of (3.1).) And there is, indeed, some evidence to suggest that Ricardo had in mind a conception of the same nature as that implied in such an interpretation of (3.2). (Some of this evidence was not available to Marx.) Somewhat indirect evidence is provided by Ricardo's references to capital as 'accumulated labour' (e.g. *Principles*, pp. 34, 410, *Works*, IV, pp. 379, 386) and to the labour required 'from first to last' in the production and marketing of a commodity (*Principles*, pp. 24–5; *Works*, II, pp. 35, 369). Of greater force, however, is the material found in the Malthus–Ricardo correspondence of 1823, the last year of Ricardo's life. In a letter of about 21 July Malthus insisted that 'the natural and absolute value of commodities in the place and at the time in which they are produced, are . . . composed of the accumulated and immediate labour worked up in them with the profits upon that labour for the time that it has been employed'. In his reply of 3 August Ricardo began, 'The value of almost all commodities is made up of labour and profits', and made no objection to Malthus's quoted proposition. (Responding, on 11 August, Malthus referred explicitly and approvingly to that opening sentence of Ricardo's, presumably taking it to be a paraphrase of his own initial proposition.) Again, on 25 August, Malthus wrote that 'the circumstances which determine the natural value of commodities must be the quantity of labour advanced, accumulated and immediate, with the profits upon such labour for the time that it has been employed', and in his reply of 31 August – his last ever letter to Malthus – Ricardo again made no objection to this proposition. There is thus good reason to think that Ricardo accepted a resolution of prices into wages and profits of the same general nature as that presented in (3.2) above. It most certainly does not involve an ignoring of non-wage capital.[10]

Non-wage capital

While it has been seen above that the view that prices can be resolved into revenues does not necessarily turn on ignoring non-wage capital, the further question remains whether Ricardo did in fact ignore it, at least when considering the economy as a whole. (The question whether Ricardo identified the rate of profit with the rate of surplus value is exactly the same question, in a slightly different guise.) It is to this question that we now turn.

There can be no question of charging Ricardo with ignoring non-wage capital at the level of the single commodity or industry. Thus the heading to section III of the *Principles* (quoted in *TSV*, II, p. 173) reads 'Not only the labour applied immediately to commodities affect [*sic*] their value, but the labour also which is bestowed on the implements, tools, and buildings, with which such labour is assisted.' And numerous examples in the *Principles* (e.g. pp. 31–2, 91, 117, 123, 387) provide explicit reference to the non-wage capital of particular capitalists or particular industries. (On the other hand, in the example of page 33, Ricardo either ignores the non-wage capitals of all three capitalists or assumes them to be equal.)

It will prove helpful to begin our consideration of Ricardo's treatment of non-wage capital at the aggregate level by turning to the *Essay on Profits*, of 1815 (quoted in *TSV*, II, p. 215). Ricardo begins by referring to an *individual's* agricultural capital, valued at 200 qrs of wheat, half of which is *fixed* capital ('buildings, implements, etc.') and to 'the neat profit', of 100 qrs of wheat, 'after replacing the fixed and circulating capital' (*Works*, IV, p. 10). It is clear that 'replacing the fixed' capital must mean 'making good the depreciation of fixed capital'. From page 11 onwards, however, Ricardo discusses the economy *as a whole*, and in his famous table (ibid, p. 17) the capital of 200 qrs of wheat, with the neat profit of 100, now reappears as the capital employed on the '1st portion of land'. However, since Ricardo must distinguish between profit and rent for the second and following portions of land, the third column of the first part of the table is labelled not 'neat

profit' but 'Neat produce in quarters of wheat after paying the cost of production on each capital'. It is most important to remember here that 'after paying the cost . . . ' means 'after replacing the fixed and circulating capital' (see above). In the final column of the second part of his table, Ricardo then presents the cumulative totals of the 'Neat produce . . . ' entries from the first part and labels that column 'Total produce in quarters of wheat, after paying the cost of production'. It might be surmised that Ricardo here uses the term 'Total' precisely because the entries are cumulative totals, but be that as it may it must be noted that Ricardo describes as 'Total produce . . . ' what he later called *net revenue* — the sum of profits and rents[11] — and that 'Total produce . . . ' is definitely defined as 'after replacing the fixed and circulating capital'. Ricardo's division of 'Total produce . . . ' into profits and rents most certainly does *not* turn on his having ignored aggregate non-wage capital; the 'problem', if there is one, is only that Ricardo's terminology is likely to mislead the careless reader.

The above interpretation does not rely on the table alone. On page 13 Ricardo refers to 'the necessity of employing more labourers, horses, etc.'; on page 15(n†) he writes that 'In proportion as the capital employed on the land, consisted more of fixed capital, and less of circulating capital'; and he repeatedly refers to the 'implements of husbandry' (pp. 19, 22, 38, 41). (It might also be conjectured that Ricardo, a considerable landowner, was not entirely unaware that corn seed — and not merely land and labour — is required for the production of corn.)

It has thus been seen that in his *Essay on Profits* Ricardo by no means ignored non-wage capital at the aggregate level and that he was quite capable of using such terms as 'Total produce' in a *potentially* confusing way. Now, as is well known (*Principles*, p. xii), the first edition of the *Principles* grew directly and immediately out of the *Essay on Profits*. If, then, Ricardo sometimes appears to ignore non-wage capital, at the aggregate level, in the *Principles*, which is the rational, reasonable working hypothesis — that that appearance is deceptive and may result from Ricardo's unusual use of terms,

or that Ricardo, in the *Principles*, has forgotten what he knew in the *Essay*?

Cantillon, the Physiocrats and Adam Smith certainly used such terms as 'the produce of the land' to mean produce in the *most* gross sense — the harvest, in effect.[12] It can therefore be surprising to find that Ricardo opens his Preface to the *Principles* with the statements that both 'The produce of the earth — all that is derived from its surface' and 'the whole produce of the earth' are distributed as rent, profits and wages. Nor are similar statements lacking in the text; on the contrary they are frequent (e.g. *Principles*, pp. 49n1, 112, 121, 347). Most puzzling of all, perhaps, is the following:

> Suppose that all the commodities in the country, all the corn, raw produce, manufactured goods, [etc.] which could be brought to market in the course of the year, were of the value of 20 millions, and that in order to obtain this value, the labour of a certain number of men was necessary, and that the absolute necessaries of these labourers required an expenditure of 10 millions. I should then say that the gross revenue of such society was 20 millions, and its net revenue 10 millions (pp. 421–2).

Since, for Ricardo, gross revenue means 'wages + profits + rents', there are only two possibilities. *Either* Ricardo is here forgetting about non-wage capital for the economy as a whole, *or* by 'all the commodites . . . which could be brought to market' he means 'all those commodities which, after the replacement of the non-wage capital — both fixed and circulating — are still available for disposal on the market'. In this latter case, Ricardo would not deserve full marks for perspicuity, but that is hardly conclusive, since Ricardo was no master of self-expression, as he well knew. We have to consider *all* the available evidence and to see whether, in the light of that over-all picture, we can or cannot make reasonable sense of Ricardo's apparently strange statements.

It has already been noted that the *Essay on Profits* shows Ricardo to be well aware of non-wage capital at the economy level and to be capable of using 'unusual' terminology. Some

further relevant evidence can now be brought into consideration.

First, in his letter to Malthus of 29 November 1820, Ricardo uses the terms 'gross produce' and 'neat produce' as *synonyms* for, respectively, the terms 'gross *revenue*' and 'net *revenue*', used in all three editions of the *Principles*.[13] Evidently, 'gross produce' here does *not* mean what that term might suggest today – it means, rather, net national income. While the 'total produce' of the *Essay* is the '*net* revenue' of the *Principles*, the 'gross produce' of Ricardo's letter is the '*gross* revenue' of the *Principles*; Ricardo's terminology is both variable and easily misinterpreted.

Second, it is to be noted that, in all three editions of the *Principles*, Ricardo stated that 'Capital is that part of the wealth of a country which is employed in production, and consists of food, clothing, tools, raw materials, machinery, [etc.] necessary to give effect to labour' (p. 95). Here tools, raw materials and machinery are explicitly reckoned as part of capital at the *aggregate* level.

Third, attention must be paid to Ricardo's changed views, in the third edition, concerning machinery and employment. In his *Notes on Malthus*, written between the second and third editions of the *Principles*, Ricardo noted that 'The effective demand for labour must depend upon the increase of that part of capital, in which the wages of labour are paid' (*Works*, II, p. 234); wage capital is only a 'part' of aggregate capital. And in the famous chapter XXXI itself, Ricardo quotes Barton's statement that 'The demand for labour depends on the increasing of circulating, and not of fixed capital' (*Principles*, p. 395n*); while Ricardo suggests that Barton exaggerates the possible consequences for employment, he certainly does not reject the statement just quoted. But he would have to have done so had he thought that fixed capital reduces to wage capital at the aggregate level. (It is of interest that even when Ricardo initially rejected Barton's argument – in his letter to Barton of 20 May 1817 – he did *not* do so by arguing that, in aggregate, all capital is wage capital; see *Works*, VII, especially p. 157.)

Fourth, and finally, we may consider two of Ricardo's detailed examples, to emphasise how prone Ricardo was to

use varying and distinctly 'net' concepts of 'produce', etc.

Take first the agricultural example found on pages 112—17 of the *Principles*. Ricardo refers to various quantities of labour which 'obtain' or 'produce' different physical quantities of wheat with a common value of £720 (pp. 112—14). He then says, 'It will be seen too, that, in all cases, the same sum of 720l. must be divided between wages and profits. If the value of the raw produce from the land exceed this value, it belongs to rent' (p. 115). It might seem obvious, particularly in view of the reference to 'the raw produce from the land', that the wheat outputs referred to must be *gross* outputs, in the modern sense, and hence that Ricardo is ignoring non-wage capital. But then, on page 117, Ricardo supposes 'that the original capital of the farmer was 3000l.', while wage capital can at most be £720; clearly, then, the initial appearance is deceptive.

Let us turn aside from Ricardo, for the moment, and consider how Ricardo's example might be presented today. Using modern terms and supposing a given set of commodity prices in terms of gold, we may define F, C, W, G and F' as the aggregate gold values of, respectively, initial fixed capital, non-wage circulating capital, wage capital, gross corn output (the harvest), and fixed capital at the end of the year. If the annual profit rate is r, then

$$(1 + r)(F + C + W) = G + F'$$

or

$$r(F + C + W) = [G - C - (F - F')] - W \qquad (3.5)$$

Clearly, each side of (3.5) represents the gold value of total profits. Returning now to Ricardo, (3.5) could express what Ricardo says provided that $[G - C - (F - F')]$ can be taken to represent his £720. But we already know from the *Essay on Profits* that Ricardo was perfectly ready to define produce 'after replacing the fixed and circulating capital', and $[G - C - (F - F')]$ is, of course, precisely such a 'produce'; such an identification is thus quite natural in the context of Ricardo's writings.

It is also important to note that (3.5) would not be a terribly useful expression for examining the *variation* of *r* with *W*, because a variation in *W* will change relative prices and hence *F*, *C*, etc. But this is *exactly* what Ricardo says. Immediately after showing how aggregate profits fall as the price of corn, and thus *W*, rises, he continues, 'But the *rate* of profits will fall still more, because the capital of the farmer, it must be recollected, consists in a great measure of raw produce, such as his corn and hay-ricks, his unthreshed wheat and barley, his horses and cows, which would all rise in price in consequence of the rise of produce' (*Principles*, p. 117). There is thus good reason to suppose that Ricardo was here well aware of non-wage capital and that, yet again, we find Ricardo defining 'produce' in a non-obvious way.[14]

The second example to be examined occurs on pages 388—90 of the *Principles*. It concerns a capitalist with a capital of £20,000 divided into £7,000 fixed capital and £13,000 'circulating capital in the support of labour'. (Non-wage circulating capital is thus ignored.) We are to suppose 'that profits are 10 per cent, and consequently that the capitalist's capital is every year put into its original state of efficiency, and yields a profit of 2,000l.' At the end of a year's operations the capitalist's workmen 'replace in his possession food and necessaries of the value of 15,000l., 2,000l. of which he consumes himself, or disposes of [as he wishes]. As far as these products are concerned, the gross produce for that year is 15,000l., and the net produce 2,000l.' It will be clear that here Ricardo is taking the wage bill to include wages for labourers who maintain the fixed capital at constant efficiency. As he had put it earlier:

> If fixed capital be not of a durable nature, it will require a great quantity of labour annually to keep it in its original state of efficiency; but the labour so bestowed may be considered as really expended on the commodity manufactured, which must bear a value in proportion to such labour (*Principles*, p. 39).

By analogy with (3.5) above, we may represent Ricardo's

example here by

$$(1 + r)(F + W) = G + F$$

or

$$r(F + W) = (G - W)$$

where $r = 10$ per cent, $F = £7,000$, $W = £13,000$ and $G = £15,000$. In this case, $C = 0$, and $F' = F$ because W allows for the labour of (completely successful) maintenance work. Ricardo continues his example by supposing that the capitalist now diverts half his workmen to producing a machine in one year. In the following year, 'The reduced quantity of labour which the capitalist can employ must, indeed, with the assistance of the machine, and after deductions for its repairs, produce a value equal to 7,500l., it must replace the circulating capital [now 5,500l.] with a profit of 2,000l. on the whole capital [still 20,000l.]' (p. 389). Here then Ricardo writes 'produce a value' where the value in question is *net* of expenses for machine maintenance but *gross* of wages! Once again we find that Ricardo's usage is highly variable but is, on close inspection, consistent with his recognising the role of non-wage capital. The present example is significant even though it refers to a particular capitalist, for on pages 391–2 Ricardo proceeds to apply his argument, *without modification*, to the economy as a whole (using net and gross produce as synonyms for net and gross revenue, it may be noted). He thus treats the capitalist of the example as a 'representative' capitalist and, by immediate implication, takes full account of non-wage capital, even at the aggregate level.

It has thus been shown both that there is direct evidence that Ricardo did not ignore non-wage capital at the economy level and that, once careful allowance is made for Ricardo's shifting and rather confusing use of terms, all his apparent denials of aggregate non-wage capital can be seen to be just that – merely apparent. Just as Marx was too ready to take Ricardo's 'value' to be his own (Marx's), so he was over-hasty in taking Ricardo's 'whole produce', etc., to mean what he (Marx) meant by that term.

Rates of profit and surplus value

Marx's only basis for charging Ricardo with identifying the rate of profit with the rate of surplus value was his unjustified belief that Ricardo ignored aggregate non-wage capital. Ricardo does not say that the rate of profit *is* (in Marx's terms) the rate of surplus value, he merely says that it 'depends on' that rate, which is a very different proposition.

Consider, for example, the well-known passage from pages 48–9 of the *Principles*. Ricardo writes that

> a rise of wages from the circumstance of the labourer being more liberally rewarded, or from a difficulty of procuring the necessaries on which wages are expended . . . has a great effect in lowering profits. [This is because a] greater proportion of the annual labour of the country is devoted to the support of the labourers.

That is, in obvious symbols, r falls when $v/(v + s)$ rises, i.e. when s/v falls. On page 126 Ricardo returns to 'the same conclusion which we have before attempted to establish – that in all countries, and all times, profits depend on the quantity of labour requisite to provide necessaries for the labourers, on that land or with that capital which yields no rent'. That is, r *depends on* v, given $v + s$, i.e. it *depends on* s/v.

Again, in his *Notes on Malthus* (which were unavailable to Marx), Ricardo writes 'The rate of profits in such a country would depend, as the rate of profits in all countries depend [*sic*], on the quantity of labour necessary to provide for the wages of the labourer' (p. 127). He again uses the expression 'will depend on', in the same context, on page 266.

Ricardo nowhere *identifies* the rate of profit with the rate of surplus value; he only says that the former rate is positively related to the latter rate. And that is certainly true under certain *ceteris paribus* conditions. Thus let the column vector w represent the aggregate real wage bundle. Post-multiplication of (3.3) above by w leads, after slight rearrangement, to the relation

$$s/v = r + (1 + r)(k_1 r + k_2 r^2 + k_3 r^3 + \dots) \qquad (3.6)$$

where $k_j \equiv (lH^j w)/(lw)$. It is clear from (3.6) that if, for example, w increases proportionately (a more liberal reward) or l increases proportionately (increasing difficulty of production), then the k_j will be unaffected, s/v will fall and hence r will also fall, so that r 'depends on' s/v. With more complex changes, of course, r and s/v might change in opposite directions; this undermines any unqualified 'depends on' claim but naturally does nothing to justify Marx's charge that Ricardo 'identified' r with s/v.

It can thus be concluded that while Marx's more consistently 'gross' approach to economic accounting was certainly better than Ricardo's strongly 'net' approach (it would have been better still had he adopted the joint-product approach to used fixed capital), Marx was not justified in criticising Ricardo for accepting Smith's resolution of prices into revenues, or in charging him with ignoring aggregate non-wage capital and with identifying the rate of profit with the rate of surplus value. Prices can be resolved into revenues, full account being taken of non-wage capital; Ricardo did not ignore aggregate non-wage capital; and he did not identify the rates of profit and of surplus value.[15]

FIXED, CIRCULATING, CONSTANT AND VARIABLE CAPITAL

As is well known, Marx distinguished not only between fixed and circulating capital but also — a separate distinction — between constant and variable capital, or, in other words, between non-wage capital and wage capital. While fixed capital is part of constant capital and variable capital is part of circulating capital, capital expended on 'raw materials and ancillaries', etc., is classed as circulating capital in the first distinction and as constant capital in the second. Marx regarded his constant/variable division of capital as of greater general significance. The 'distinction between constant and variable capital . . . arises from the *immediate process of production* in which the capital is involved [while the] distinction between *fixed* and *circulating* capital . . . arises from the *process of the circulation* of capital' (letter to Engels, 2 August 1862), and Marx made production, not circulation, the centre of his whole analysis. Indeed, Marx saw his distinction as essential

for 'penetrating through to the inner mechanism of the capitalist production process' (*Capital*, II, p. 294), and claimed that with the emphasis placed on fixed and circulating capital the 'all-important distinction between variable and constant capital is thereby obliterated, and with it the whole secret of surplus-value formation and of capitalist production' (ibid, p. 296).[16]

It is not surprising, then, that Marx criticises Ricardo for using only the fixed/circulating distinction. Thus in *TSV* (II, p. 373) he states that while Ricardo took over the fixed/circulating distinction from the Physiocrats and Adam Smith, 'Nowhere does he touch on or perceive the differences in the organic composition within the actual process of production.' And in *Capital* (II, pp. 304–5) he says that 'Ricardo . . . constantly confuses the ratio between variable and constant capital with the ratio between circulating and fixed capital' and refers to 'The distinction between variable and constant capital, which . . . Ricardo . . . confused with that between circulating and fixed capital.'

We now know (as Marx could not) that Ricardo did at one point, in his 1818 comments on Torrens, hit on the non-wage/wage capital distinction, but one should not overemphasise this point. Ricardo, after all, did *not* modify the second or third editions of the *Principles* in the light of his new-found distinction (see *Works*, IV, pp. 305–6, 312). Of greater interest, perhaps, is the point that – as Marx himself noted (*TSV*, II, p. 173; *Capital*, II, pp. 293–5) – Ricardo's statements and examples frequently refer *only* to fixed capital and to wages! In the (impossible) case of there being no raw materials, semi-finished inputs, etc., the two distinctions in question naturally coincide. (See *Principles*, pp. 30–2, for several such examples and for an identification of circulating capital with wage capital (p. 32), but also for an example in which raw material, corn, is mentioned explicitly.) Marx 'explains' Ricardo's frequent omission of raw materials by saying (*Capital*, II, p. 295) that the double distinction runs throughout Ricardo's work and that 'Ricardo has far too great an instinct for logic not to be sensitive to this, and he therefore just lets this part of the capital disappear'!

Marx was right to say that Ricardo did not use the constant/

variable capital distinction, but was he right to regard this as a criticism? After all, one can simply divide capital *three* ways – fixed capital, non-wage circulating capital and wage capital – and not make *either* of the two-way aggregations discussed above; indeed, one can divide capital expenditure far more finely still when it is necessary to do so, as it is in constructing an adequate theory of the rate of profit and of natural prices. Rather than decide which of two aggregative distinctions to adopt, one might better refuse to adopt either. While Marx's distinction certainly does focus attention on the labour process and on the capitalists' most awkward and peculiar input – the one with a will of its own, the one that can go slow, refuse to perform normally, or even refuse to be an input at all, whatever the contract says – the fact is that the special place of the worker in the production process can be discussed perfectly well without the use of the constant-capital/variable-capital distinction.

2   LABOUR AND WAGES

Before we consider Marx's principal criticisms of Ricardo in relation to labour and wages – concerning intensity and duration of work, on the one hand, and the concept of labour-power, on the other – it will be useful to note how much Ricardo and Marx had in common concerning wages, both with respect to 'natural wages' (the value of labour-power) and with respect to deviations therefrom.

THE NATURAL WAGE AND THE VALUE OF LABOUR-POWER

In chapter V of the *Principles*, 'On Wages', Ricardo defines the natural wage as follows: 'The natural price of labour is that price which is necessary to enable the labourers, one with another, to subsist and to perpetuate their race, without either increase or diminution' (p. 93). He explains that by saying 'to subsist' he does *not* imply that the physical bundle of wage goods purchased is merely sufficient for biological

survival and reproduction:

> It is not to be understood that the natural price of labour,
> estimated even in food and necessaries, is absolutely fixed
> and constant. It varies at different times in the same coun-
> try, and very materially differs in different countries. It
> essentially depends on the habits and customs of the people
> . . . Many of the conveniences now enjoyed in an English
> cottage would have been thought luxuries at an earlier
> period of our history (pp. 96—7).

Ricardo had already explained, in chapter 1, section II, that
in speaking of 'the' wage he is not ignoring the existence of a
structure of differential wage rates. Rather, he is following
Adam Smith in supposing that *relative* wage rates are stable
for considerable periods of time. (See page 22 for Ricardo's
long quotation from Smith.) Ricardo mentions explicitly that
this structure of relative wage rates 'depends much on the
comparative skill of the labourer, and intensity of the labour
performed' (p. 20; see also p. 21) and on the 'time necessary
for the acquirement of one species of manual dexterity more
than another' (p. 22). Ricardo, then, can refer to 'the' natural
wage and it seems that he takes that wage, 'estimated . . . in
food and necessaries', to be given, in a given country over a
given period, throughout his discussion of the market wage
(pp. 94—6).

New when Marx defines the subsistence bundle which,
together with the values of the wage goods, defines the value
of labour-power, his approach is *indistinguishable* from
Ricardo's. Consider, for example, Marx's presentation in
Capital (I, pp. 275—6). The worker's necessary means of sub-
sistence 'vary according to the climate and other physical
peculiarities of his country' but also, of course, contain a
'historical and moral element' and 'depend therefore to a great
extent on the level of civilisation attained' in that country.
'Nevertheless, in a given country at a given period, the average
amount of the means of subsistence necessary for the worker
is a known *datum*.' This wage 'must include the means neces-
sary for the worker's replacements, i.e. his children, in order
that this race of peculiar commodity-owners may perpetuate

its presence on the market'. And it must allow for the costs of acquiring 'skill and dexterity in a given branch of industry'. Exactly the same approach is given by Marx in, for example, volume I of *Capital* (pp. 655, 1067) and in volume III of *Capital* (p. 859); it is identical to Ricardo's approach to the natural wage. (It may be of interest to note that in *Capital* (I, pp. 275–6, 1067), in which Marx presents exactly the same views as Ricardo, he quotes Thornton, Petty, Torrens, Vanderlint, Turgot and Malthus, but never Ricardo. The section from Torrens's *An Essay on the External Corn Trade* which Marx cites is also quoted by Ricardo in his chapter 'On Wages' (p. 96n*).)

THE MARKET WAGE, POPULATION AND ACCUMULATION

That Ricardo's theory of the movement of the market wage rate involved the dependence of population on wage levels, and that Marx vigorously renounced any such dependence in his corresponding theory, is both well known and (unlike some things which are 'well known') true. It is nevertheless important not to exaggerate the difference between their theories of the market wage.

In his discussion of the market wage (*Principles*, pp. 94–6) Ricardo starts by saying that the market wage depends on 'the proportion of the supply to the demand' for labour. The supply of labour is then said to respond to the market wage, in such a way as to push this latter towards the natural wage, while the demand for labour is related to the accumulation of capital: 'in proportion to the increase of capital will be the increase in the demand for labour'. Ricardo also suggests that 'if the increase of capital be gradual and constant', then the market wage may remain above the natural wage 'for an indefinite period'. Ricardo does not note that this last point may lead to a conceptual difficulty – since the natural wage itself depends on what workers are accustomed to – but he does remark (p. 99) that the relation between population and subsistence is not simply a 'natural fact' but depends on 'education' and on social institutions. Ricardo was also well aware – a fact which is insufficiently noticed – that labour supply cannot be expected to respond to natural-wage/market-

wage differences with the speed at which the outputs of com-
modities may respond to natural-price/market-price differ-
ences (p. 165). And it may be recalled that in his chapter on
machinery, in the third edition, Ricardo unambiguously
abandoned any idea that the demand for labour necessarily
rises in strict proportion to the accumulation of capital: 'The
demand for labour will continue to increase with an increase
of capital, but not in proportion to its increase; the ratio will
necessarily be a diminishing ratio' (p. 395; Ricardo's quotation
from Barton appears in the footnote to this sentence).

Ricardo's *Notes on Malthus* (not available to Marx) are also
of considerable importance for our present discussion. For
not only does Ricardo emphasise that only 'part' of the total
capital constitutes a demand for labour (*Works*, II, p. 234;
quoted above), but he makes quite explicit the two-way inter-
action between wages and accumulation:

> if population did not keep pace with capital, labour would
> rise, and the quantity of corn which I should annually
> obtain, instead of increasing in the proportions of 1,000,
> 1,300, 1,700 and so on, might, by the sacrifices I should
> be obliged to make to obtain the labour required, increase
> my capital only in the proportions 1,000, 1,200, 1,300
> [etc., etc.]. The precise reason then that my accumulation
> goes on at a slow pace, is that there is a scarcity of labour
> (ibid, p. 321; see also pp. 8, 252, 265, 302–4).

That is, not only will wages rise if capital increases faster
than labour – obviously, in order to be consistent with his
earlier statement (p. 234), Ricardo should have said 'if that
part of capital . . . ' – but that very rise of wages will lower
profits and thus reduce the rate of accumulation. The only
theoretical element of Marx's later analysis which is lacking
here is the argument that the rise in wages may encourage a
relative increase in that 'part of capital' which does *not* con-
stitute a demand for labour, thus enhancing the 'negative
feed-back effect' on the rising wage. But that very element is
also to be found in Ricardo's work if we return to the chapter
on machinery in the *Principles* (p. 395). For Ricardo there
makes both the statement that rising wages over time 'will

have a tendency to determine the saved capital in a greater proportion than before to the employment of machinery' and the suggestion that in America, where food is cheap and wages are low, 'there is not nearly such great temptation to employ machinery as in England, where food is high'. (A related point appears on p. 41,n*.)

To insist that this is not yet the whole of Marx's analysis (of the issue at hand), because 'constant capital' is not just machinery, would be merely to quibble. The essential theoretical elements of Marx's analysis in sections 1—3 of chapter 25 of *Capital*, vol. I, 'The general law of capitalist accumulation', are to be found in Ricardo's work. It goes without saying that the alleged 'rising organic composition of capital' is given far greater emphasis by Marx than by Ricardo, that in discussing the supply of labour Marx paid great attention to such factors as 'land clearance', and that Marx did not appeal to any 'Malthusian' principle — far from it! But the fact remains that Marx's analysis (of the issue at hand) is essentially Ricardo's analysis *minus* the 'population principle'; certainly it is *not* the case that Ricardo's analysis was reducible to the 'population principle' and was then simply replaced by Marx's analysis, based on the alleged rise in the organic composition. It would be nearer the mark to say that Ricardo's *eventual* understanding of the demand for labour was identical to Marx's, but that while Ricardo retained the influence of the Malthusian principle on the supply side, Marx considered any such influence irrelevant, arguing, rightly or wrongly, that the changing composition of capital was quite sufficient to prevent labour supply from becoming a check on accumulation (e.g. *Capital*, I, p. 793).

In *TS V* (II, p. 400) Marx asserts that Ricardo cannot explain why

> *The value of labour* is . . . determined by the *means of subsistence* . . . Ricardo has in fact no answer, other than that the law of supply and demand reduces the average price of labour to the means of subsistence that are necessary . . . for the maintenance of the labourer. He determines *value* here, in one of the basic propositions of the whole system, by *demand and supply*.

Now it must be noted, first, that Ricardo here appeals to demand and supply to keep the market wage moving back towards the natural wage. He does *not* appeal to demand and supply to determine the natural wage itself, so that the main force of Marx's criticism is misdirected. (It is of interest that Marx rejected precisely this kind of confusion in the third of his famous list of four questions; see *A Contribution to the Critique of Political Economy*, p. 62.) And it may be noted secondly (and less importantly) that Marx's own approach is thus no different from that of Ricardo which is here (inappropriately) criticised. Marx appeals to the demand for and supply of labour to keep pushing the wage towards the value of labour-power, no less than Ricardo does to keep pushing the market wage towards the natural wage: this point is quite independent of any difference between Ricardo and Marx on what determines the supply of labour.

THE WORKING DAY AND THE INTENSITY OF LABOUR

In volume II of *TSV* Marx repeatedly criticises Ricardo for taking the working day to be of a fixed length: for example, 'From the outset [Ricardo] assumes, as Adam Smith and his predecessors seem to have done as well, that the *length of the working-day is given*' (p. 413; see also pp. 405–6, 408, 416–17, 438). This in turn means, Marx asserts, that 'the *compulsion to perform surplus-labour* [is] not recognised' by Ricardo (p. 405; cf. p. 406). And in volume I of *Capital* this criticism is extended: '[Ricardo] recognizes no change either in the length of the working day or in the intensity of labour' (p. 660).

It has already been noted above that Ricardo was certainly aware that the *relative* intensities of labour in different jobs influenced relative wages; a more general statement is to be found in his *Notes on Malthus* (p. 87), in which he wrote 'In comparing a day's labour of one country, with a day's labour of another, we must take into our consideration the intensity of labour'. Ricardo then struck out the last four words and replaced them by 'the different quantities of labour, which may be comprised under the general term of a day's labour'. Whether Ricardo regarded this substitution as a mere rephras-

ing, or whether he intended it to take account of both intensity differences and differences in hours worked per day, must remain a matter for speculation. But in either case it remains clear that Ricardo was well aware that 'a day's labour' is not an unambiguous phrase.[17] As for Marx's specific complaint that Ricardo does not recognise *changes* in the working day or in the intensity of labour, it is not clear how one can say more than that Ricardo does not discuss such changes explicitly. Certainly it is striking that Marx produces *no* worthwhile evidence in volume II of *TSV* to support his many statements that Ricardo regards the length of the working day as fixed, none of the four passages which he cites in *TSV* (II, pp. 414–17) being genuinely relevant. Those from *Principles* (pp. 403–4, 404n* and 411) which Marx cites are quite grotesquely misused here by Marx, and even that from page 273 of the *Principles* has to be read in a forced way by Marx to provide apparent 'evidence' for his charge.

It is also unclear that much weight should be attached to Marx's statements that Ricardo does not recognise the 'compulsion to perform surplus-labour'. Ricardo's whole theory of profit, after all, turned crucially on the proposition that the 'proportion of the annual labour of the country . . . devoted to the support of the labourers' is less than unity – i.e. that surplus labour is performed! Marx's statements should perhaps be regarded as merely exaggerated expressions of the indubitable fact that Ricardo did not present Marx's graphic accounts of the labour process, the struggles over the working day, the impact of machinery and modern industry, etc. More serious, it might be thought, is Marx's criticism of Ricardo that 'by not *directly* showing that one *part* of the labourer's *working-day* is assigned to the reproduction of the value of his own labour-power, he introduces a difficulty and obscures the clear understanding of the relationship' (*TSV*, II, p. 405). But as Marx himself had just pointed out (ibid, pp. 404–5), this division of an individual worker's working day is, at best, only a striking metaphor; that division can only be defined by reference to the rest of the economy, since the worker is not producing his own physical wage bundle. Whatever one might think of the persuasive power of that metaphor, it is greatly inferior, as an analytical device, to Ricardo's division of the

total annual labour into that required for the support of the labourers, and the remainder.

LABOUR-POWER

We come now to Marx's concept of labour-power, his use of which (and their lack of) he regarded as a major dividing-line between himself and all the Classical economists — including, of course, Ricardo. It was Marx's view that his introduction of this concept made possible the solution of a crucial problem within Classical political economy, a problem which Ricardo had not solved (or even raised).

An earlier statement of this crucial problem is to be found in the *Grundrisse* (pp. 560—2), but its most famous and clearest formulation appears in the *Critique of Political Economy* (pp. 61—2), which grew out of the *Grundrisse*. Marx here presents what he takes to be the four principal objections advanced against Ricardo's 'determination of value by labour-time'. The second objection ('advanced against Ricardo by bourgeois economists [and] later taken up by socialists' (p. 62n*)) is that 'If the exchange-value of a product equals the labour-time contained in the product, then the exchange-value of a working day is equal to the product it yields, in other words, wages must be equal to the product of labour.' Thus, Marx says, the following problem has to be solved: 'how does production on the basis of exchange-value solely determined by labour-time lead to the result that the exchange-value of labour is less than the exchange-value of its product?'[18]

This same problem is set out in various forms in Marx's discussion of Ricardo in volume II of *TSV*: 'Now wage-labour, however, is a *commodity*. It is even the basis on which the production of *products* as *commodities* takes place. The *law of values* is not applicable to it. Capitalist production therefore is not governed at all by this law. Therein lies a contradiction' (p. 397). Or again, *why* is the labour commanded by a commodity greater than the labourer embodied in it? 'Ricardo simply answers that this is how matters are in capitalist production. Not only does he fail to solve the problem; he does not even realise its existence in Adam Smith's work.'[19]

Yet another statement of the problem is to be found in the

opening pages of the short chapter 19 of volume I of *Capital*, where Marx goes on to criticise the Classical economists for not facing up to it. He suggests that these economists 'unconsciously substituted' the question 'what is the cost of production of the *worker?*' for the original, insoluble question 'what is the cost of production of labour?' Without realising what they had done, Marx asserts, the Classical economists slid from the 'value of labour' to the 'value of labour-power' (ibid, pp. 677–9).

It is, of course, the concept of labour-power that Marx regards as providing the solution to the 'problem': it is not labour but labour-power which the worker sells to the capitalist and the sale of labour-power at its value is perfectly consistent with the creation of a surplus. The 'law of value' is thus *not* undermined by the existence of profit, interest and rent.

Is there a problem to solve?

It might well be thought that the above 'problem' is simply spurious. Let us refer to whatever it is that workers sell to capitalists as 'it', thus postponing the question whether 'it' is best described as labour, or as labour-power, or as disposal over the workers' time, etc. By definition, 'it' is exchanged but *'it' is most certainly not produced, let alone produced for the explicit purpose of sale.* Thus 'it' is not a product and the question how 'it' can be a product which exchanges according to the 'law of value' and yet allow for the existence of a surplus is thus simply a *non-*question. There is no need to solve the 'problem' by introducing the concept of labour-power (or any other concept); it is necessary only to see clearly that there is no problem to be solved.

Interestingly, Marx repeatedly gives oblique recognition to this fact, for he often refers to labour-power as a 'peculiar commodity'; and he takes the value of this 'peculiar commodity' to be different from that of commodities in general by containing a historical and moral element. In each case Marx is recognising, in a roundabout fashion, that it is actually inappropriate to call labour-power a commodity at all! 'Labour power is a commodity and thus has a value' is at best a figure

of speech, a somewhat forced analogy, which enables one to give the semblance of a solution to a 'problem' which actually requires no solution whatever. While the concept of labour-power was intended to give *greater* coherence to the 'law of value', by bringing 'labour' under its sway, it actually *reduced* the coherence of Marx's discourse, by forcing him to use the concept of commodity in a merely metaphorical manner at a crucial point within his theory.

Classical political economy

In the light of the above we may return to Marx's suggestion that the Classical political economists unconsciously slid from the problem of determining the 'value of labour' to that of the 'cost of producing the worker'. It is noteworthy that while the passage in question is an extended one (*Capital*, I, pp. 677—9), Marx cites not one piece of evidence in support of this suggestion. There is no reason to suppose that the Classical economists ever took such phrases as 'value of labour' or 'natural price of labour' to mean *anything other than* the 'value or natural price of the worker's subsistence'. Of some interest in this regard is a change in wording between the first and third editions of Ricardo's *Principles*. (Marx, it will be recalled, probably used the third edition only.) Thus 'natural rate of wages' in the third edition (p. 94) replaced 'natural price of wages' in the first and second editions; 'natural price of labour' in the second and third editions (p. 95) replaced 'natural price of wages' in the first edition; while 'market price of labour' and 'natural price of labour' in the second and third editions (p. 96) replaced 'market price of wages' and 'natural price of wages', respectively, in the first edition. We see that Ricardo's conscious change of wording moved, if anything, in the *opposite* direction to the unconscious movement of thought attributed to Classical political economy by Marx! Ricardo actually put 'price of labour', the phrase to which Marx objected, in place of 'price of wages', a term far more immediately suggestive of 'the cost of producing the worker'. When Marx concludes that 'Classical political economy stumbles approximately on to the true state of affairs, but without consciously formulating it' (*Capital*, I, p. 682), we may not unreasonably read this as 'Classical political economy arrives

at the true state of affairs, never having had any need to make the unconscious substitution of questions which I attributed to it four pages ago.'

The crucial element in the Classical theory of profits and of exchange values is that the real-wage bundle is taken as a *datum*. Since Marx shares that very assumption (as was pointed out above), Marx's criticism of Classical theorists for referring to the 'value of labour' rather than to the 'value of labour-power' is, with respect to the present issue, a mere quibbling about words which does *not* reflect any significant difference in concepts.

The significance of labour-power for Marx

For Marx, however, the concept of labour-power seemed to do more than solve the (non-) problem which he emphasised in the *Critique*. It was supposed to assist in revealing the origin of surplus value, to provide a basis for discussing absolute and relative surplus value and to expose the 'false appearance' of the wage as payment for a full day's work.

At the end of a week, after having worked in the normal, expected manner, some workers are observed to receive their wages. Observer X states, 'Those workers are being paid for having performed N hours of labour.' Observer Z retorts, 'Those workers are being paid for their labour-power (or for the capitalist's disposal over their labour-power).' Are the statements of X and of Z really *significantly* different?

In normal circumstances, to have disposal over workers' ability to work means precisely to get them to perform a certain number of hours of a certain kind of work: if they remain idle, or even work less hard than was anticipated by the capitalist, then the latter *does not have* full disposal over the workers' capacity for labour. As Marx readily admits, 'If the worker cannot provide labour of an average degree of efficiency, and if he cannot therefore supply a certain minimum of work per day, he is dismissed' (*Capital*, I, p. 694). Under normal circumstances either X's description or Z's will serve equally well, because they come to the same thing. (Z's has the distinct disadvantage, however, of appearing to be more profound, when it is not.)

The only real force of Marx's insistence that it is labour-

power (or the disposal over it) that is sold by the worker is that labour contracts are never absolutely precise — perhaps necessarily so — with the result that there is always room for dispute over what the worker can or cannot be made to do (or expected to do without specific instruction). More generally, of course, hours of work, intensity of work, conditions of work, etc., are always open to dispute and often disputed. These are all highly important issues — but *the concept of labour-power adds nothing to one's understanding of them.* The mere fact that Marx repeatedly referred to labour-power when discussing a number of important topics must not mislead one into supposing that the concept of labour-power is *necessary* to such discussion. It is not.

Nor does that concept assist in explaining the existence of surplus (as opposed to providing a form of words in which the issue can be described). This point is illustrated beautifully by a passage from chapter 19 of volume I of *Capital* (p. 679):

> As the value of labour is only an irrational expression for the value of labour-power, it follows of course [it will be transparent that *nothing can follow* from this, 'of course' or otherwise] that the value of labour must always be less than its value-product, for the capitalist always makes labour-power work longer than is necessary for the reproduction of its own value.

In the first part of this sentence Marx gives the (false) impression of leading up to a logical deduction from the concept of labour-power, but in the end all he does is to assert a *fact* about capitalism. His concept of labour-power does not permit Marx to do anything other than he criticised Ricardo for doing: *that is*, taking it as a simple fact about capitalism that workers work longer than would be necessary to produce their wage goods. To *describe* this fact by saying that total labour performed exceeds the value of labour-power does nothing whatever towards providing an *explanation* of the fact. Yet Marx's footnote to the paragraph from which our quotation is taken reads:

Cf. [*Critique*, p. 62], where I state that, in my analysis of

capital, I shall solve the following problem: 'how does production on the basis of exchange-value solely determined by labour-time lead to the result that the exchange-value of labour is less than the exchange-value of its product?'[!]

The reason why Marx so insisted on the use of the redundant concept of labour-power is probably to be found in volume I of *Capital*, 'Results of the immediate process of production' (p. 1073). Immediately after referring once again to the second (non-) problem of the *Critique*, Marx writes: '*Price* which is not reducible to *value*, whether immediately or through a series of mediations, expresses a merely accidental exchange of something for money.' Marx returns here to the assertion made in criticism of Ricardo (and quoted above) that if prices, profits, etc., cannot be determined on the basis of labour times then they are undetermined, irrational expressions, averages of nothing. But Marx is simply mistaken; the classical, given real wage (which Marx accepts) and the conditions of production suffice to determine the rate of profit and all relative prices (and thus *prices* in terms of gold). Values, the value of labour-power and labour-power itself are completely irrelevant.

3   SUMMARY

It has been argued that Marx's criticism of Ricardo for 'identifying cost prices and values' consists of no more than a verbal muddle on Marx's part and that he was quite wrong to suggest that Ricardo did not appreciate that relative prices differ from relative labour contents, when profits are positive, whether or not wages *change*. Marx was also wrong to criticise Ricardo for introducing the uniform rate of profit right at the beginning of his argument and to suggest that, contrary to Ricardo's reasoning, 'luxury' sectors influence the rate of profit. It was then shown that there is no intrinsic objection to accepting Adam Smith's resolution of prices into revenues and that Ricardo, contrary to Marx's suggestion, did not ignore non-wage capital, even at the aggregate level, and did not identify the rate of profit with the 'rate of surplus value'.

It was then urged that, while Marx was correct to state that Ricardo used the fixed/circulating capital distinction and not the constant/variable capital distinction, it is far from clear that this constitutes a criticism of Ricardo.

In the section on labour and wages it was pointed out that Ricardo's treatment of the natural wage and Marx's treatment of the value of labour-power are virtually indistinguishable and that Marx was wrong to suggest that Ricardo appealed to supply and demand at this stage in his argument. It was also suggested that, while differences between Ricardo's and Marx's analyses of the deviation of the market wage from the natural wage (the value of labour-power) undoubtedly exist, those differences are easily exaggerated, for Ricardo accepted both the falling ratio of wage capital to total capital and the effect of the real wage rate on that ratio. As for Marx's criticism of Ricardo for ignoring the length of the working day, the intensity of labour and the compulsion to perform surplus labour, it was suggested that one should remain agnostic. It was then argued, finally, that Marx was not justified in criticising Ricardo for failing to recognise the concept of labour-power, since that concept does not enable one to discuss or resolve any genuine issue that cannot be discussed and resolved equally well without it.

Need it be repeated that we have not said that Ricardo was always right and Marx always wrong?

NOTES TO CHAPTER 3

1. That Diane Elson's reading of Marx is quite different from mine has made her comments on this essay all the more helpful. I am also grateful to Michael Evans, Heinz Kurz and Alessandro Roncaglia for interesting comments. I should like to draw the attention of readers of German to Kurz's *Zur neoricardianischen Theorie des Allgemeinen Gleichgewichts der Produktion und Zirkulation*, which, amongst other things, arrives at conclusions close to those of the present essay concerning Marx's criticisms of Ricardo.

2. Unless otherwise stated, references to Ricardo's *Principles* are always to the third edition. All references to Ricardo's works are to the Sraffa edition, the abbreviation *Works* sometimes being used.

3. References to the three parts of *Theories of Surplus Value* will be

given as *TSV*, followed by the part number. A similar style will be used for the three volumes of *Capital*. The title of *A Contribution to the Critique of Political Economy* will generally be abbreviated.

4. Rent will not be discussed in this essay.

5. It appears from *TSV* (II, pp. 217–18, 235) that Marx was so opposed to 'identifying cost prices with values' because he took such an identification to spring from Adam Smith's 'adding-up' theory of value. It will be clear that this is not a rational basis for objecting to Ricardo's use of synonyms.

6. To see this, consider the case in which the real-wage bundle contains only Sraffa basics (in positive quantities) and consult, in conjunction, Steedman (1977b, p. 174) and Steedman (1977a, p. 325).

7. See note 4 above.

8. See *TSV* (II, pp. 219, 373–4, 434, 438, 463–4, 485–6, 491, 548–9, 564–5); *Grundrisse* (pp. 552–3); *Capital* (I, pp. 510n, 736); *Capital* (II, pp. 465–6); *Capital* (III, pp. 836, 842, 862–3); letter to Engels, 6 July 1863.

9. See both the original article of Pasinetti (1973) and the exposition in Steedman (1977b, ch. 12).

10. Heinz Kurz has drawn to my attention the irony involved in Marx's polemics against the resolution of prices into wages and profits — had they been justified, those polemics could *also* have been turned against the determination of the labour values of commodities!

11. Of course, Ricardo did on occasion suggest that *part* of the wage bill might be considered to be a part of net revenue; see *Principles* (p. 348n*).

12. See, for example, Cantillon's *Essai* (pp. 43–4); Meek (1973, pp. 121–36); Smith, *Wealth of Nations* (pp. 315–6, 629, 637).

13. See *Works* (II, p. 381) in conjunction with *Works* (VIII, p. 311).

14. See also *Principles* (pp. 117, 122, 348).

15. In the light of what has been shown above concerning both the 'luxury' sector and Marx's allegation that Ricardo ignored aggregate non-wage capital and thus identified the rate of profit with the 'rate of surplus value', little need be said concerning Marx's criticism of Ricardo's theory of the falling tendency of the rate of profit. (See *Grundrisse*, pp. 753–6; *TSV*, II, pp. 379–80, 438–9, 463, 541.) It is worthy of remark, however, that in *TSV* (III), when trying to argue that even the cheapening of constant capital through technical progress cannot prevent the alleged rise in the 'organic composition of capital', Marx was forced back to an appeal to the difficulties of improvement in agriculture (p. 368)!

16. Cf. *Capital* (II, pp. 301–2) and *TSV* (II, pp. 578–9).

17. See also *Works* (IV, p. 393).

18. Diane Elson has suggested that it would be of great interest to consider how far Marx's reading of Ricardo was affected by his concern to combat the political influence of 'Ricardian socialism'.
19. See also *TSV* (II, pp. 398—9, 400, 405—6).

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Value and Exploitation: Some Recent Debates

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In his introduction to the first (1956) edition of *Studies in the Labour Theory of Value*, Ronald Meek made it clear that his intention in writing the book was to convince critics of the intellectual respectability of the theory. The explosion of academic literature on the subject in the 1970s supplied ample proof of his success, and relatively few would now agree with one of those critics, who unwittingly played a significant part in the writing of Meek's book, that value is 'just a word' (Joan Robinson, 1964, p. 47). But the proliferation of books and articles, the reinterpretation of Marx's arguments and their mathematical reformulation have served also to generate controversy. Assessments of the merits of Marx's theory of value continue to differ wildly, even the criteria by which the theory is to be judged remaining a source of profound disagreement.

The present essay surveys the debate on value and exploitation which was provoked by Samuelson's first (1971) article in the *Journal of Economic Literature*, and which is still in progress. Its aim is to bring some order to the conceptual chaos which has resulted from these controversies. The first section is concerned with the requirements which Marx imposed upon his theory of value: with the conditions, that is, which he required to be met before that theory could be counted a success. The next three sections consider the extent to which the theory did in fact succeed, and do so under increasingly less stringent assumptions: the choice of techniques, and the treatment of joint production and fixed

capital, ignored in section 2, are introduced in sections 3 and 4 respectively. Section 5 deals not with the *sufficiency* of Marx's theory of value but with its *necessity*: not with the internal logical structure and consistency of the labour theory of value, but with the charge that it is redundant, and should on that account be discarded. The concluding section touches briefly on some important questions which have *not* figured prominently in recent controversies, and suggests that the debate might profitably be shifted towards them.

SECTION 1

Marx's prime concern in his economic work was to 'lay bare the economic law of motion of modern society' (Marx, 1867, p. 10). To this task, that of uncovering the forces determining the rate of accumulation of capital and the barriers to its self-expansion, all else was subordinated. Accumulation, Marx argued, depended on profits, and profits in their turn were generated by the production of surplus value. The first and most important function of his theory of value was to demonstrate the relationship between surplus value and profits; and its secondary function was to provide a satisfactory means of measurement of the economic aggregates upon which his analysis of accumulation hinged. This *is* a secondary function, but it is presupposed by the fact that the whole of Marx's substantive analysis of accumulation is carried out in terms of values rather than prices of production. It is *not* sufficient, therefore, to regard the first (and admittedly primary) function of the theory of value as the *only* criterion by which the theory is to be assessed (see, for example, Baumol, 1974).[2]

Bearing this in mind, it is possible to outline the conditions which Marx himself would have required to be satisfied by his theory of value (though these conditions are nowhere in his writings explicitly listed as such). First, labour values must in some relevant sense be 'well-defined', so that no doubt can arise as to the value of any particular commodity in given circumstances at any moment in time. This I propose to call Condition 1. Second, values must be positive in magni-

tude, for labour is a human activity, and cannot meaningfully be negative (nor, if time is usefully spent in its performance, can it be zero) in amount. This may be termed Condition 2. Finally, it must be possible to demonstrate a precise relationship between surplus value and profits (Condition 3).

The exact implications of this third requirement are a matter of some dispute, and the condition has been formulated in various ways. In its weakest form it requires only that, for any capitalist economy taken as a whole, positive surplus value (or a positive rate of exploitation) is both a necessary and a sufficient condition for the existence of positive profits (or a positive rate of profit).[3] This essentially qualitative proposition has been described by Morishima and others as the *Fundamental Marxian Theorem*;[4] I shall refer to it as Condition 3a. A rather stronger condition (3b) is that aggregate surplus value and aggregate profit be equal in magnitude. This is immediately identifiable as one of the two 'invariance conditions' specified by Marx in his analysis of the transformation of values into prices of production, the other being equality between the sum of values and the sum of prices. The third and strongest version of Condition 3, and that prescribed by Marx himself, is that *both* invariance conditions be satisfied. I shall refer to this as Condition 3c.

The necessity for Conditions 1 and 2 is hardly at issue, though neither turns out to be as trivial as at first appears to be the case, and the precise meaning of Condition 1 will be found to be rather ambiguous. With respect to the three versions of Condition 3 it is impossible to be so confident. Few would cavil at 3a, which does indeed express the heart of Marx's theory of exploitation: the dependence of the incomes of non-producers on the surplus labour of the producers. If this condition fails, it is evident that something is seriously wrong with Marx's analysis. Most Marxists have regarded the 'Fundamental Marxian Theorem' not so much as too weak, but rather as entirely self-evident (incorrectly, as will be seen in section 4), and have represented Marx as establishing the truth at least of the rather stronger Condition 3b. Marx himself repeatedly opted for the strongest version of all, namely Condition 3c, and this has puzzled many commentators. When the transformation of values into prices is formulated

as a set of simultaneous linear equations, a *second* invariance condition proves to be mathematically redundant (Seton, 1957), and it is tempting to conclude that it serves no essential purpose in the structure of Marx's argument, whether verbal or mathematical (see, for example, Meek, 1977, pp. 117–18).

This, I think, is a mistake. Marx knew very well what he was doing. His discussion of the transformation of values into prices comes in the section of volume III of *Capital* dealing with the formation of a general rate of profit. It both precedes and forms the logical basis for his analysis of the tendency for the rate of profit to fall, a tendency which Marx regarded as fundamental to his over-all account of capitalist accumulation.[5] But this account itself is conducted entirely in value terms. That is, it rests upon the assumption that the rate of profit expressed as a ratio of values is identical to the rate of profit expressed as a ratio of price aggregates, so that a correct theory of the former is also a correct theory of the latter. If this is not the case, then 'Marx's argument . . . is internally inconsistent. He assumes that $s/(c + v)$ is the rate of profit but then derives the result that prices diverge from values, which means precisely, in general, that $s/(c + v)$ is *not* the rate of profit' (Steedman, 1977, p. 31). It is a simple matter to demonstrate that the satisfaction of both invariance conditions is sufficient (though not always necessary) for the equality of 'value' and 'price' rates of profit. This, it seems to me, is why Marx insisted on what I have termed Condition 3c; and he was right to do so.[6]

SECTION 2

These, then, are the requirements which must be satisfied before the labour theory of value can be deemed adequate to the task Marx alloted to it. In this section I consider their validity in a capitalist economy in which only circulating capital is employed; in which each industry produces one and only one commodity, there being no joint production; and in which there is only one (constant-returns-to-scale) technique of production available to each industry. These assumptions

are neither 'realistic' nor obviously justifiable on any other ground, and are made solely in order to simplify an already complicated problem. They were almost universally present in the literature before the appearance of Morishima (1973). They will be dropped in subsequent sections, at a cost in increased complexity which will soon become apparent. Both in this and in subsequent sections I abstract from the problems posed by differences in skill levels among workers.[7] Throughout the paper, until section 6 is reached, I assume free competition and the 'exchange of equivalents'.

Once these assumptions are made, Conditions 1 and 2 present no problems. Values can be calculated from a set of simultaneous linear equations, and certain well-known propositions in matrix algebra guarantee that each commodity has a unique and positive value (Steedman, 1977, pp. 67–8).

Condition 3a is easily verified, while 3b can be satisfied by the appropriate selection of a 'normalising equation' (see Seton, 1957). Condition 3c is rather more troublesome, the circumstances under which both invariance conditions are met remaining a question of controversy and no little confusion. It has been variously argued that *both* aggregate values equal aggregate prices *and* total surplus value equals total profits, if:

(a) The economy is partitioned into Marx's three departments; the output of department III, conventionally assumed to consist of gold, is used as *numéraire*; and this department possesses an organic composition of capital equal to the social average (Bortkiewicz, 1907);

(b) There is equality of 'internal organic compositions of capital' in all industries (Samuelson, 1971, p. 415);

(c) All industries are linearly dependent upon one another (Morishima, 1973, pp. 77–82);

(d) A standardisation procedure suggested by Morishima and Catephores (1978, pp. 160–6) is followed;

(e) 'Capacity outputs' are *either* produced *or* used as weights (Fujimori, 1977);

(f) Sraffa's 'standard commodity' is used as *numéraire* (Meek, 1961; Medio, 1972; Eatwell, 1974–5);

(g) 'If and only if the labour *embodied* in *all* the capital goods is equal to the labour *commanded* by the capital

goods used, directly or indirectly, in producing the wage bundle' (Steedman, 1977, p. 174); or

(h) The economy is on a von Neumann balanced equilibrium growth path (Morishima, 1974; Morishima and Catephores, 1978, p. 172, n. 46).

The first three of these alternatives need not detain us. We must discard (a) as excessively restrictive, since it requires, not only that non-distorting aggregation into three departments is possible, but also that the rate of accumulation is zero (that is, that simple reproduction prevails), and that department III actually does possess the social average organic composition of capital, which will be true only by accident (Morishima and Catephores, 1978, p. 162). Alternative (b) is a special case of (c), and may therefore be discarded (Morishima and Catephores, 1978, p. 172). The remaining cases are all related. The standardisation procedure (d) 'implies that commodities are produced, after the adjustment, in the amounts which are equal to the necessary outputs . . . uniformly expanded at the average rate of surplus outputs' (Morishima and Catephores, 1978, p. 162). These are precisely Sraffa's 'standard proportions', so that alternative (d) is identical to alternative (f); and the 'capacity outputs' proposed by Fujimori (e) are analogous. Hence (d), (e) and (f) are merely different formulations of the same proposition. To summarise: if *either* the economy actually produces the Sraffian 'standard commodity', *or* its actual output is expressed in terms of the 'standard commodity', then Condition 3c is satisfied. Evidently alternative (h) is merely a special case of this, since an economy in von Neumann equilibrium growth actually produces the 'standard commodity' (it is a *special* case, since the capitalists are supposed to accumulate *all* their profits, and 'live on air').[8]

On the asssumptions made at the beginning of this section, all Marx's requirements for the success of his theory of value can be fulfilled. All commodity values are unique and positive, and the rate of profit prevailing when commodities are sold at their prices of production is fully determined as a ratio of quantities of embodied labour. It must be emphasised, however, that this demonstrates only the sufficiency of the labour theory of value. Its necessity has not been established, and

will be challenged in section 5. Once the assumptions are changed, even the question of sufficiency must be re-opened, and this is attempted in the next two sections.

SECTION 3

I now relax one of the assumptions made in the previous section, and allow the existence of alternative techniques of production; consideration of the problems of joint production and fixed capital is deferred to section 4. Allowing capitalists a choice of production techniques raises rather obvious problems concerning Condition 1, that labour values be 'well-defined' and unique. If there are several ways of producing a particular type of mousetrap, each with different (direct plus indirect) labour requirements, which 'quantity of embodied labour' represents *'the* value' of the mousetrap? Presumably that quantity needed in the technique actually in use. But *which* technique will be used, and why? Suppose two or more techniques are employed at the same time. Does a mousetrap then have more than one value, at any given moment? Presumably not. How, then, is *the* (single) value of a mousetrap to be defined?[9]

Of these questions, the most awkward concerns the factors governing the choice of technique(s), which impinges on the broader issue of the alleged logical priority of values and surplus values over prices and profits; I return to it at the end of this section. Where several techniques have been selected, and are in use at a given point in time, two cases may usefully be distinguished: either techniques differ in profitability, or they do not. In the first case techniques may be arranged in a hierarchy according to their profitability. There is, in this case, an obvious parallel with the Classical problem of lands of differing fertility, and a 'Ricardian' solution to the problem of value immediately suggests itself. Define the value of a mousetrap as the quantity of labour required to produce it *at the margin,* that is under the *least* favourable conditions, using the least profitable techniques currently employed, and derive the price of production of a mousetrap accordingly. (*Mutatis mutandis,* surplus value and profit may be defined similarly.) Capitalists operating with intra-marginal techniques,

for example with newer and more productive machines, obtain 'quasi-rents', or, as Marx himself put it, 'super-profits' (see Marx, 1894, pp. 194—5).

These definitions ensure that values remain unique and positive, so that Conditions 1 and 2 are satisfied. So, too, is Condition 3a, while there seems no reason why 3b and 3c need not be fulfilled, so long as super-profits are excluded from the calculation of aggregate surplus value and aggregate profit. This approach has been described, quite deliberately, as 'Ricardian'. It is certainly *not* that favoured by Marx, whose criticism of the Ricardian theory of rent was a strident one, and who repeatedly defined socially necessary labour as the *average* (not the maximum) needed to produce a commodity under prevailing technical conditions. But for Marx the theory of rent was a peripheral concern, and one on which he was ill at ease.[10] In this context, at least, it may be sensible to revise Marx in a Ricardian manner, though this does mean accepting the (distinctly un-Marxian) notion that equal quantities of homogeneous labour create different amounts of value (see section 4).

Such a revision would not, however, affect the second case under discussion. Here, as Morishima's simple numerical example makes abundantly clear,[11] there is no way in which the uniqueness of values can be established. At a switchpoint between techniques capitalists are by definition indifferent between them, since each is equally profitable. There is thus no single 'marginal' technique, analogous to marginal land in the Ricardian theory of rent, to serve as the standard for the calculation of value. True, the *average* amount of labour embodied in a mousetrap *can* be ascertained, once the mix of techniques actually employed is known, but this will vary with every fleeting change in the relative importance of each technique.[12] The best that can be done in the circumstances is to postulate the distribution of techniques as a datum right at the start, in much the same way as orthodox general-equilibrium theory takes as given such important phenomena as preferences, initial endowments and technology.

But this merely evades the question of how techniques are selected by the capitalist. In the second case considered above, the choice is essentially arbitrary, since by assumption

all are equally profitable. More generally this will not be true, and we are on safe Marxian gound in concluding that capitalists will operate only the most profitable of the techniques available to them. This, however, seems to put the cart before the theoretical horse: if the rate of profit determines the choice of techniques, and the choice of technique determines values, what is left of Marx's claim that values are logically *prior* to prices and profits (Steedman, 1977, pp. 64–5)? I return to this problem in section 5.

SECTION 4

The existence of joint production gives rise to even more serious difficulties for the labour theory of value. The basic problem is easily stated. Each sheep contains both wool and mutton, in proportions which may be taken to be effectively fixed by nature. While the amount of labour embodied in a sheep may readily be calculated, it is unclear how the *separate* values of the wool and the mutton could be established, since it is impossible to produce either commodity without also producing the other. Even more important than joint production *tout court* is the question of fixed capital, which plays such a fundamental role in Marx's analysis of accumulation. Now the employment of fixed capital can be regarded as a form of joint production, and in fact (it is claimed) *must* be so regarded if it is to be analysed in a satisfactory way. But in a regime of joint production, values may be ill-defined, or even negative (Steedman, 1977, p. 150), so that either Condition 1 or Condition 2 (or both) collapse.

Marx avoids these complications by assuming the life of a machine to be technically determined, and treats depreciation as a process of physical decay. Each year the mousetrap-making machine loses a given proportion of its value, which is transferred into ('embodied in') the year's output of mousetraps. This treatment can give rise to nonsensical results, including the possibility that old machines may possess (and pass on) a negative value (Steedman, 1977, pp. 142–6). Moreover, it allows the capitalist no choice with respect to the economic life of his machines, and prevents Marx from making any dis-

tinction between the physical deterioration of machines and their economic obsolescence, even though he fully recognised the importance of such a distinction (Morishima and Catephores, 1978, pp. 23–31; cf. Marx, 1894, p. 112). These are not trivial questions, for the replacement cycle of fixed capital played a crucial role in Marx's own account of the periodicity of economic crises (see, for example, Howard and King, 1975, ch. 6). Yet they cannot adequately be resolved by the depreciation method which he adopts.[13]

They can, however, be discussed if fixed capital is treated as a process of joint production, as (for example) by von Neumann (Morishima and Catephores, 1978, pp. 26–9). In this approach a mousetrap machine produces, each year, *both* a quantity of mousetraps *and* a mousetrap machine one year older than it was at the beginning of the year, the older machine being regarded as a joint product along with the mousetraps. Since all industries use fixed capital of some description, joint production is a universal rather than an exceptional phenomenon, and Condition 2 may no longer hold: the values of old machines may be negative.

Consider the following example of joint production first proposed by Steedman (1975). There are two processes with outputs of moustraps (commodity 1) and cheese (commodity 2). (The commodity names are mine, not Steedman's.) Process 1 combines five moustraps with one unit of labour to produce six mousetraps and one pound of cheese. Process 2 uses ten pounds of cheese and one unit of labour to produce three mousetraps and twelve pounds of cheese. If the values of the two commodities are derived by conventional linear-equation methods, then according to process 1, $5\lambda_1 + 1 = 6\lambda_1 + \lambda_2$, and according to process 2, $10\lambda_2 + 1 = 3\lambda_1 + 12\lambda_2$, so that $\lambda_1 = -1$ and $\lambda_2 = 2$. (Note immediately the violation of Condition 2, since the value of mousetraps is negative.) Assume further that six units of labour are employed, five in process 1 and one in process 2. Inputs therefore total 25 mousetraps and 10 pounds of cheese; gross output is $(6)(5) + (3)(1) = 33$ mousetraps plus $(5)(1) + (12)(1) = 17$ pounds of cheese; and net output, which is simply gross output minus inputs, consists of $(33 - 25) = 8$ mousetraps and $(17 - 10) = 7$ pounds of cheese. Steedman specifies the real wage, per six

units of labour, to comprise 3 mousetraps and 5 pounds of cheese. Hence the value of labour-power, equal to variable capital (v), is $(3)(-1) + (5)(2) = 7$. Total living labour $(v + s)$ is by assumption equal to 6, and it necessarily follows that surplus value, given by $s = (v + s) - v = -1$, so that surplus value is *negative*. But it is a simple matter to demonstrate that both the rate of profit and total profits are *positive*.[14] Thus condition 3a, the so-called Fundamental Marxian Theorem, is false; so, obviously, are the stronger Conditions 3b and 3c.

Note that there is no fixed capital in this example. In fact, condition 3a is *not* jeopardised if the use of fixed capital represents the only element of joint production, for in such a system *only* the values of old machines can be negative.[15] And Steedman himself emphasises that surplus value is not necessarily negative in the more general cases of joint production illustrated by his example. In fact, he does not specify the conditions under which joint production *will* generate negative surplus value. The mere possibility is enough.[16]

Is Marx's entire theory of value to be regarded as a dreadful mistake? There are two ways in which this conclusion might be avoided. One involves the rejection of von Neumann's treatment of fixed capital in favour of an alternative approach with less alarming implications, and is discussed later in this section. The other requires no break with von Neumann, but does entail a fundamental reformulation of the concept of labour value. Negative values are nonsensical, argue Morishima and Catephores; Steedman has derived only 'pseudo-values', and 'pseudo-surplus value'. The 'true value' of a commodity must be redefined as the *minimum* amount of labour required to produce it. 'True values' cannot emerge from any system of simultaneous linear equations, but they can be calculated by linear programming methods. Necessary labour (v) is defined as the *minimum* quantity of labour required to produce the consumer goods paid to the workers. In Steedman's example it is found that 3 mousetraps and 5 pounds of cheese can be produced with least labour by not using process 1 at all, and employing 2½ units of labour on process 2. This produces 7½ mousetraps (4½ of which are costlessly thrown away), and 5 pounds of cheese. Since $v = 2½$, and $(s + v) = 6$,

s = 3½, and the (newly defined) rate of exploitation is (3½)/ (2½) = 140 per cent (Steedman, 1977, pp. 192–4; Morishima and Catephores, 1978, pp. 32–6; see also Harcourt and Kerr, 1979). The 'true values' of mousetraps and cheese are zero and +0.5 respectively (Morishima and Catephores, 1978, pp. 33–6).[17]

These 'true values' fulfil Condition 1 and also, in a rather weak way, Condition 2 (they cannot be negative but can, as in the example, be zero). Condition 3a is also satisfied, since the Fundamental Marxian Theorem retains its validity when values, necessary labour and surplus value are given their new definitions. Condition 3b and 3c *cannot* in general be satisfied, as will shortly be seen. Whether the analysis would in any case satisfy Marx may be doubted. Morishima and Catephores (1978, pp. 23–9) claim too much when they ascribe to Marx the parentage of their concept of 'true values'. As was noted earlier, for Marx it is always the average, not the minimum, labour requirements which determine value (see also on this point Steedman, 1976).

More important is the fact that the 'true values' are non-additive: that is, they do not permit the value of a commodity to be expressed, as it is by Marx, as the sum of the constant capital, variable capital and surplus value embodied in it. The 'true value' of the constant capital employed in the example is (25)(0) + (10)(0.5) = 5, so that the sum of $c + v + s$ is (5 + 2½ + 3½) = 11. This is clearly *not* equal to the value of gross output, which is given by (33)(0) + (17)(0.5) = 8½.

Marx seems to have regarded additivity to be so obvious as to need no justification, as indeed it is in an economy of single-product industries. To abandon it would require – at the very least – a drastic reformulation of many of his most important arguments. Marx's reproduction schema, for example, are constructed on the basis of additive values, and the conditions for uninterrupted accumulation are derived accordingly. So, too, is his painstaking analysis of the circulation of capital. This is the process $M \rightarrow C \rightarrow C' \rightarrow M'$, where a sum of money ($M$) is converted into constant and variable capital of the same value (C), transformed in production into qualitatively different commodities of a higher value (C'), which are then sold at their value for a sum of money larger than that with

which the capitalist began (M'). Marx interprets the difference between C' (the value of gross output) and C (the value of the constant and variable capital inputs) as surplus value. But this is no longer the case when 'true values' are concerned.

If a satisfactory analysis of fixed capital were available which did not regard its use as a form of joint production, these unpalatable conclusions might be resisted, avoiding both the von Neumann treatment of fixed capital and the negative values associated with Marx's method. Kurz (1979) suggests a way in which this might be achieved. He had been anticipated by Armstrong, Glyn and Harrison (1978, p. 11), whose

> approach consists of dropping the idea that all direct labour creates the same amount of value, in order to maintain that of linear value transference (with respect to use value). With this method both value transferred and value added are proportional to the number of use values [physical units of a commodity] produced. Thus both magnitudes are always positive, as are the values of all partly worn out machines.

Their numerical example, only slightly embellished, runs as follows. A mousetrap machine is produced by one unit of (unaided) labour. One unit of labour operates the machine to produce 29 mousetraps in the first year of its life, one mousetrap only in the second year, and none thereafter. On Marx's reckoning the value of a mousetrap is $\frac{1}{10}$ (30 divided by the 3 units of labour required, 1 indirect and 2 direct, to produce them). Thus the value of output in the first year is $\frac{29}{10}$, of which living labour ('value added') equals 1 and dead labour (transferred from the machine) $\frac{19}{10}$. The value of the one-year-old machine is thus $1 - \frac{19}{10} = -\frac{9}{10}$. On the method proposed by Armstrong, Glyn and Harrison, value transferred in the first year would be $\frac{29}{30}$, and value transferred in the second year would be reckoned at $\frac{1}{30}$. Since the value of the output of mousetraps is respectively $\frac{29}{10}$ and $\frac{1}{10}$, 'value added' must be $(\frac{29}{10} - \frac{29}{30}) = \frac{58}{30}$ in the first year, and $(\frac{1}{10} - \frac{1}{30}) = \frac{2}{30}$ in the second year. All magnitudes are positive, as they would also be if calculated on the Ricardian basis suggested in section 3.

The marginal process is that which uses the old machine, so that the value of each mousetrap is reckoned as the sum of the dead labour ($\frac{1}{30}$) and the living labour (1) required on that process, that is, $\frac{31}{30}$.

Table 4.1 applies these three different interpretations to the socio-technical data[18] of Armstrong, Glyn and Harrison's example. In the value system calculated according to Marx's assumptions there are two disquieting features: the negative

<div align="center">

TABLE 4.1
Fixed capital and value

</div>

SOCIO-TECHNICAL DATA

Process 1	1 new machine + 1 labour → 29 mousetraps + 1 old machine
Process 2	1 old machine + 1 labour → 1 mousetrap
Process 3	1 labour → 1 new machine

MARX'S VALUE SYSTEM

	Dead labour (c)	Living labour $(v + s)$	Total labour $(c + v + s)$
Process 1	$\frac{12}{10}$	1	$\frac{22}{10}$
Process 2	$-\frac{9}{10}$	1	$\frac{1}{10}$
Total	1	2	3

ARMSTRONG, GLYN AND HARRISON'S VALUE SYSTEM

	Dead labour (c)	Living labour $(v + s)$	Total labour $(c + v + s)$
Process 1	$\frac{22}{30}$	$\frac{55}{30}$	$\frac{22}{10}$
Process 2	$\frac{1}{30}$	$\frac{2}{30}$	$\frac{1}{10}$
Total	1	2	3

KING'S (RICARDIAN) SYSTEM VALUE

	Dead labour	Living labour	Value ($= c + v + s$ *only* for process 2)
Process 1	$\frac{22}{30}$	1	$\frac{31}{30}$ × 29
Process 2	$\frac{1}{30}$	1	$\frac{31}{30}$
Total	1	2	31

value of the old machine, and the fact that the value of the new machine ($\frac{19}{10}$) is almost double the quantity of labour needed to produce it. Armstrong, Glyn and Harrison's method has the worker employed on the new machine, at a given intensity and skill, producing *twenty-nine times* as much value as an identical worker operating an older machine. Nor — and this is a decisive objection — does their proposal avert the possibility of negative surplus value. If there is free competition in the market for labour-power, wages will be equal in both processes. Thus, if the value of labour-power exceeds $\frac{2}{30}$, surplus value produced on process 2 will be negative, and this will be the case whenever the rate of exploitation on process 1 falls below 2800 per cent! (If $v = \frac{2}{30}$, $s = \frac{56}{30}$ and $s/v = 28$). My own Ricardian definition of value avoids these problems, but is in some ways equally outlandish, the value of the total output of mousetraps $(\frac{31 \times 29}{30})$ being virtually ten times the total labour employed in the system. The *scale* of the anomalies revealed in Table 4.1 can be attributed to the peculiarities of the specific numerical example chosen, but the general principles which apply are independent of any particular example.[19] It may be objected that capitalists would be most unwilling to use the old machine of Table 4.1. But this cannot be established without a theory of the choice of techniques, and such a theory is supplied only by the von Neumann (nonadditive values) approach.

To summarise the argument so far: if no account is taken either of alternative processes or of the existence of fixed capital and joint production, all the conditions specified in section 1 can be met. Allowing a choice of technique complicates matters considerably, though with a redefinition of value and in the absence of too many switch-points between techniques the theory is not beyond salvation. The treatment of fixed capital demands much less pleasant decisions: either undertake a quite dramatic revision of the whole concept of value, abandoning Conditions 3b and 3c along the way, or else resign oneself to an inability to deal with some of the most important questions in the theories of value and accumulation. The case for the sufficiency of the labour theory of value, then, is severely dented. What of its necessity?

SECTION 5

When Samuelson (1957, p. 892) dismissed the labour theory of value as a 'complicating detour', he was repeating a charge of some antiquity. Over the previous century many of Marx's critics had pronounced the death of the theory. The novelty of Samuelson's claim was that he made it, not from an avowedly neoclassical perspective, but in the context of a constant-coefficient model of the type introduced to most Marxists by the later publication of Sraffa's work (1960). Its full significance, therefore, did not become apparent until Samuelson returned to the theme in the 1970s, after the implications of Sraffa had begun to sink in. Samuelson then renounced (for the sake of argument) his impressive neoclassical pedigree and declared his analysis to be itself 'Sraffian' (Samuelson, 1973, p. 64). Thus Sraffa managed to discomfort not only neoclassical but also Marxist economists, shedding new light on an old question: '*Was* Marx's journey really necessary?' (Meek, 1977).

The case for a negative answer to this question has been made most eloquently, and repeatedly, by Steedman: 'Anything that can be expressed in terms of value magnitudes,' he argues in Robinsonian tones, 'can be expressed without them, since they are only derivative of the more fundamental physical production conditions and real wages' (1977, p. 111). Sraffa has shown how the rate of profit and prices of production can be derived *directly* from information concerning the conditions of production and the real wage (as indeed had Samuelson in 1957, and also, by implication, von Neumann in the 1930s). But precisely the same information is required for the calculation of labour values. Steedman's conclusion that 'the value determination [of the rate of profit] is just a clumsy, derivative form of the physical one' (p. 63, n. 15) is illustrated in Figure 4.1, where Marx's journey is shown to be much longer and more arduous than it need have been. Figure 4.1 rests on the assumptions made in section 2 of the present essay. Once these assumptions are relaxed, Steedman's case is even stronger. Fixed capital considerations (section 4) make Marx's journey impossible, since no algorithm will transform values into prices and satis-

fy all the conditions specified in section 1. The existence of alternative techniques of production suggests that Marx's journey, if feasible, must be made *in reverse*, for the choice of techniques depends upon the rate of profit, and values depend upon the choice of techniques (see section 3), so that it appears to be the case that values are determined by the rate of profit, and not vice versa (Steedman, 1977, pp. 64–5).[20]

```
MARX'S        Conditions    }    Values                              Prices of
JOURNEY       of production }  →Surplus —── (Transformation) ──→     production
              Real wage     }    value      algorithm               Rate of
                                                                     profit

SAMUELSON'S   Conditions    }                                        Prices of
AND SRAFFA'S  of production }  ─────────────────────────────────→    production
JOURNEY       Real wage     }                                        Rate of
                                                                     profit
```
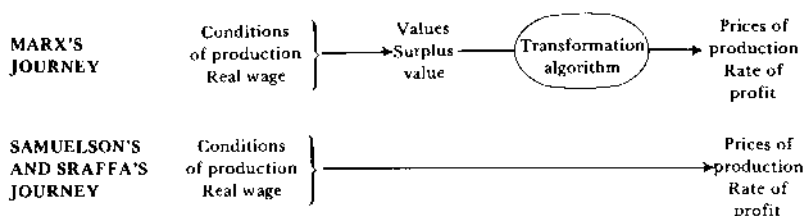
FIGURE 4.1   Two different route-maps

In any case, as Figure 4.1 indicates, even if it is *possible* to transform values into prices, in that order, it is unnecessary to do so. Occam's Razor must be wielded, and the labour theory of value declared redundant. Such is the conclusion of Samuelson and Steedman.[21] Not surprisingly, these conclusions have stirred up a hornet's nest of Marxist protest, the best representatives of what is already a vast literature being Fine and Harris (1976, 1977). Some of their critical thrusts are deftly parried by Steedman. It is, as he notes, absurd to defend the Marxian theory of value on the grounds that the determination of prices is a relatively minor problem, true though this may be. The determination of the rate of profit is undeniably a *major* problem, the solution to which simultaneously determines prices (Steedman, 1977, p. 20). Nor is it the case that the Samuelson—Sraffa approach neglects Marx's concept of abstract labour and considers only concrete labour, for

the *very fact* that these different labour-times, expended in a capitalist economy, are added together means that they are treated as abstract labour-time. (One can no more add 7 hours of *concrete* coal-mining labour to 3 hours of *concrete* tea-making labour than one can add 7 apples to three oranges (ibid, p. 19, n. 9).

And if the conditions of production are 'asocial and ahistorical', as some Marxists have alleged, the same must be true of the labour values derived from them (ibid, p. 67).[22]

Steedman demonstrates, against the (rather bizarre) allegation that he focuses upon exchange relations to the neglect of production, that his analysis can profitably be employed to investigate the nature of the labour process itself (ibid, pp. 77—87). While this effectively disposes of the charge (Roosevelt, 1975) that the Samuelson—Sraffa approach is permeated by commodity fetishism, Steedman might have driven the point home by exposing a glaring inconsistency in his opponents' case. It cannot be argued, as many Marxists do, both that wage determination belongs to 'the sphere of exchange' and operates 'at a more superficial level of analysis', *and* that Marx's· *Capital* moves effortlessly from the analysis of production (vol. I) through circulation/exchange (vol. II) to their dialectical reunification (vol. III). A glance at the chapter headings of vol. I will reveal not merely a long chapter (on 'The general law of capitalist accumulation') analysing the industrial reserve army of the unemployed as the regulator of real wages, but also an entire part entitled 'Wages' and including two chapters dealing in some detail with the 'superficial' question of methods of wage payment. Either Marx was hopelessly confused, or the Marxists are entirely wrong (or, just conceivably, both).

There is something very odd indeed about the notion that the determination of real wages takes place 'outside production', 'in the sphere of exchange', as if it had no more to do with production than (say) price determination in a prisoner-of-war camp when the Red Cross parcels arrive. Wage determination is, rather obviously, an aspect of *distribution*, and the Marxists would be wise to remember Marx's strictures against those who attempted rigidly to separate production and distribution. 'The relations of distribution,' he argued against Sismondi, 'are only the relations of production seen from a different aspect' (Marx, 1972, p. 56). 'The form of production,' he reminded John Stuart Mill, 'is simply the form of distribution seen from a different point of view' (ibid, p. 84).

There are two issues in connection with which Steedman is on weaker ground. One concerns epistemology, and the

other hinges on the nature of the theory of exploitation which remains 'after Sraffa'. The epistemological question is this. It is evidently the case that all scientific concepts are inevitably 'theoretical', 'abstract' and (in some sense) 'unrealistic'; if they were not, they would have no claim to be *scientific* concepts. It is also presumed to be true that 'reality' has an existence of its own, independent of the beliefs and mental processes of any individual human observer; if not, there would be no grounds for challenging any account or analysis of reality given by anyone, be they Marxist, Buddhist or Trappist. How, then, is one to appraise the 'validity', 'truth' or 'relevance' of scientific concepts with respect to reality? To be more specific, what criteria should be applied in assessing the merits of alternative theoretical approaches to the analysis of a capitalist economy?

The majority of Marxist participants in the debate on value have been content to assert the primacy of theory (by which they always mean *their* theory, rather than, say, Steedman's), and to dismiss their opponents as 'mere empiricists'. Hodgson (1974) impales himself most emphatically on the opposite horn of the dilemma, where he is joined, apparently, by Steedman (Morishima keeps his distance):

> Now if these two profit rates differ, which is the significant one? Which will affect capitalists' decisions and actions? And which will tend to be made uniform, as between industries, in a competitive economy? The answer is self-evident: it is the money rate of profit which affects decisions and tends to be equalised. The 'value rate of profit', used by Marx, is of no concern to capitalists, it is unknown to capitalists and there is no force acting to make it equal as between industries. The implication is clear: $S/(C + V)$ is *not* a significant rate of profit in a capitalist economy, and it does *not* equal the actual, money, rate of profit (Steedman, 1977, p. 30).

I am not unsympathetic to this argument, and have indeed made use of it in explaining Marx's insistence on what I have termed Condition 3c. But the argument contains a fatal flaw, for prices of production are *themselves* a theoretical construct, albeit at a lower level of abstraction than labour values.

Hence the 'actual, money, rate of profit' determined simultaneously with price is *also* a theoretical concept, only one stage 'closer to reality' than Marx's 'value rate of profit'. Nor is it self-evident that ever-closer approximation to reality is a theoretical virtue, since a mere catalogue of day-to-day fluctuations in rates of profit, industry by industry, would be of no theoretical interest whatsoever. Unless the relationship between theory and reality, between abstract scientific concepts and the 'actual phenomena' which motivate capitalists, can be specified more clearly, the criteria for rejecting one theory and replacing it with another remain unknown.[23] I rather suspect that this problem is insoluble. Certainly I do not pretend to know the answer. This is no reason, however, for refusing to recognise its existence.

The second problem is mercifully less esoteric, and is neatly stated by Harcourt and Kerr (1979, p. 15):

> Marx argues that profits are to be found in the sphere of distribution and exchange of a capitalist economy that is characterised by competitive markets in all commodities, including labour-power, because in the capitalist mode of production the capitalists have a monopoly of the means of production. This monopoly enables them to make the workers (who have only their labour-power to sell) work for longer periods than they would need to work in order to produce, with the existing techniques of production, their wage-goods. The surplus so created is available for capitalist consumption and/or for reinvestment so that the system may not only be reproduced but may also expand. Conceptually, the total working day may be split into necessary labour — the period of time needed to produce the wage-goods — and surplus labour, which is the source of surplus value and therefore of capitalists's profits, from which come their consumption and/or further accumulation. It is *this* fundamental insight, compared to which the undoubtedly important real world phenomenon of joint production is but a tiresome detail, that seems to have been lost sight of in Steedman's discussion.

Exactly what, then, *is* the basis of a 'Sraffian' theory of exploitation?

Samuelson's analytical conversion did not induce him to offer an answer to this question, despite some none-too-subtle prompting by Baumol (1974). Morishima and Catephores plump unhesitatingly for a theory of surplus value which might be termed 'neo-Marxian', the prefix signifying only that Morishima's 'true values', rather then Marx's own 'pseudo-values', must be employed. The incomes of non-producers are still explained, as by Marx, in terms of the surplus labour performed by the producers; surplus labour is simply defined and measured in a different way. Hodgson (1976, p. GH10), at the other extreme, concludes 'that this concept of embodied labour can be nothing more than a metaphor, devoid of material basis in any social reality and any corresponding phenomenal form'. There is only the surplus product, and this 'is measured by its price' (ibid, p. GH18).

In *Marx After Sraffa*, Steedman seems, rather surprisingly, to follow Morishima rather than Hodgson. Sraffa's achievement lies, he argues, not in re-establishing an apologetic theory of income distribution, but in providing an even clearer basis for proving the truth of the Fundamental Marxian Theorem (Steedman, 1977, pp. 34–5). The theorem can be demonstrated with heterogeneous labour, without any 'reduction' of one type of labour to another, the concept of surplus labour retaining its validity (ibid, pp. 92–3). Morishima's analysis of surplus labour is commended (ibid, pp. 192–4). Now 'the determination of Morishima's necessary and surplus labour quantities requires knowledge only of the physical conditions of production and real wages: no reference whatever is made to Marx's additive values' (ibid, p. 194). Not to *Marx's additive values*, certainly, but *some* notion of 'surplus value' *is* inevitably involved in any reference to surplus labour. Steedman's conclusion thus proves Harcourt's and Kerr's fears to be unfounded, but it does so at the expense of some damage to his own, earlier (and deeply Robinsonian) conclusion: 'Anything that can be expressed in terms of value magnitudes can be expressed without them' (ibid, p.111) – anything, that is, except the concept of exploitation. Apparently a journey rather akin to Marx's is necessary after all.

This is *not*, in fact, Steedman's conclusion, as is clear from a more recent summary of his argument in which he is at

pains to deny that surplus value (surplus labour) explains the existence of profit. They are 'both ways of calibrating the surplus [product] . . . the existence of exploitation (*narrowly defined*) and the existence of profit are no more than two sides of the same coin: they are merely "labour" and "monetary" expressions of the fact that there is a physical surplus' (Steedman, 1979, p. 11, emphasis added). Surplus value is rather more than Hodgson's 'metaphor', but it is not an explanation of profit. The 'physical surplus' (of commodity outputs over inputs) exists because of the capitalist class monopoly over the means of production. Value and price aggregates (that is, surplus labour and profit) are simply alternative measures of the surplus product.

Figure 4.2 illustrates two possible versions of Steedman's conclusion, and compares them with two plausible interpretations of Marx's argument. The arrows represent the direction of causality; concepts at the same (horizontal) level cannot be used to explain one another. Steedman and Marx differ on the causal significance of surplus labour, but agree in placing profit at the lowest level of the conceptual hierarchy and class monopoly over the means of production at the top. In this sense (which is not an unimportant one) both have the same theory of exploitation, *broadly* defined. It is a theory which seems to be shared by some of Steedman's critics: 'In Sraffa's analysis,' complains one reviewer, 'we lose the *clear and forceful exposé* of surplus extraction . . . [and] Marx's vivid portrayal of how the labour of the direct producers is stolen' (Roemer, 1979, p. 98, emphasis added). Another is reluctant to sacrifice 'the *great transparency* that the value reasoning gives to certain crucial properties of the capitalist system' (Kurz, 1979, p. 59, emphasis added). The primary function of value arguments, then, is to *illustrate* and *clarify* a theory of exploitation based upon the capitalists' class monopoly of the means of production. With this conclusion Steedman (and perhaps even Marx himself) might well agree.

SECTION 6

Thus far, and in common with the protagonists in the debates

MARX (VARIANT 1)

Class monopoly

↓

Surplus labour

↓

Surplus product

↓

Profit

MARX (VARIANT 2)

Class monopoly

↓

Surplus labour

↙   ↘

Surplus product   Profit

STEEDMAN (VARIANT 1)

Class monopoly

↓

Surplus product

↙   ↘

Surplus labour   Profit

STEEDMAN (VARIANT 2)

Class monopoly

↙   ↓   ↘

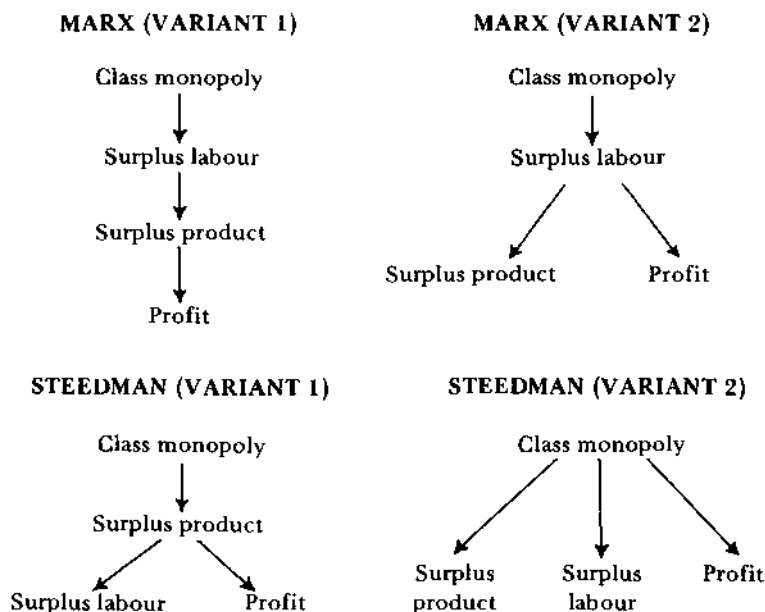Surplus product   Surplus labour   Profit

FIGURE 4.2   Different explanations of profit

that I have been concerned with, I have assumed that equivalents are exchanged, holding it to be axiomatic that surplus value originates in production and is only *redistributed* in exchange or circulation. (Admittedly the axiom tends to break down where fixed capital is employed, and Condition 3b is no longer satisfied).[24] That it is no trivial matter is obvious from a consideration of what it entails. If exchange and circulation activities have no effect on the aggregate magnitudes of surplus value and profit, it follows that the growth of monopoly has no effect upon real wages, since more powerful capitalists gain only at the expense of weaker ones. And the terms on which international trade is conducted have nothing at all to do with the degree of exploitation of workers in poor countries.

In essence this is Marx's position, though he does allow a crucial exception to his position on the consequences of monopoly,[25] and in places appears to countenance the notion of exploitation through unequal international exchange. The

arguments underpinning Marx's assertion of the primacy of production over exchange are well known, but the reasons for them (in this context) are less well understood.[26] Marx's main priority was to confront those 'utopian' socialists (especially Gray and Bray in England, and Proudhon in France) who saw inequality of exchange as the *only* source of exploitation, and believed that the establishment of equal exchange was both possible in isolation from changes in production relations and *sufficient* in itself to eliminate all sources of income other than the performance of labour. It was important for Marx to demonstrate that this was false; that exploitation in production was sufficient to explain the existence of non-wage incomes; and that the abolition of unequal exchange was only a necessary, and by no means a sufficient, condition for the establishment of a classless society. It was important, in other words, for him to distinguish clearly between merchant and industrial capital (see Rowthorn, 1974).

It was not essential, however, for him to assert — as in fact he generally did — that in industrial capitalism unequal exchange, far from being the only source of exploitation, was *no source at all*. There is no fundamental inconsistency, I suggest, between Marx's over-all theory of historical materialism (which claims priority for the relations of production), and the attribution of some degree of independent influence, or 'relative autonomy', for the relations of exchange which are, 'in the last resort', derived from them. The opposite view, indeed, is uncomfortably reminiscent of the 'vulgar Marxist' reduction of 'superstructure' to 'base' which no one would now support without serious reservations.

If this argument is accepted, there are some serious questions facing the theory of value and exploitation, every bit as serious as those debated in the recent controversies. For one thing, the prices derived in the Samuelson—Sraffa approach, like Marx's own prices of production, are competitive equilibrium prices. There is no theory of monopoly price in the literature surveyed in this paper, and scarcely any recognition of the omission.[27] Does an increase in the degree of monopoly raise the aggregate rate of exploitation, thereby — in the absence of realisation difficulties — increasing the rate of

profit? Can monopolists be said to exploit their customers as well as their workers? On an international level, does unequal exchange entail that exploitative relations exist between nations, as well as between classes (Emmanuel, 1972; Andersson, 1976)? These questions, I suggest, merit serious consideration from Marxists and 'neo-Ricardians' alike.

NOTES TO CHAPTER 4

1. This is a revised version of a paper given in Australia at the Eighth Conference of Economists at La Trobe University in August 1979. I am grateful for helpful comments from G. Catephores, L. Csapo, G. C. Harcourt, M. C. Howard and I. Steedman, none of whom shares responsibility for errors or opinions.
2. Both functions are essentially quantitative. This paper is not concerned with the qualitative aspects of the theory of value. The validity of Marx's arguments concerning the social character of commodity production, the alienation of labour, and fetishism, is not at stake in any assessment of his quantitative value theory (see Sweezy, 1946, ch. 2).
3. As regards production only; problems of the realisation of surplus value are ignored.
4. For the origins and history of the Fundamental Marxian Theorem, see Morishima and Catephores (1978, p. 30, n. 15).
5. This is not to say that Marx's analysis of the tendency is itself satisfactory (the overwhelming majority of writers, whether Marxists or not, find it unsatisfactory in varying degrees).
6. Marx was entirely wrong, however, to include those industries producing neither means of production nor wage goods (the so-called department III) in both the numerator and the denominator of the expression $s/(c + v)$. As Ricardo had already proved, and Sraffa and many others have confirmed since, these 'non-basics' should without exception be excluded from the calculations, since they have no influence whatever upon the rate of profit.
7. On this problem see Steedman (1977, pp. 178–9); Bowles and Gintis (1977, 1978); and Morishima (1978).
8. See Nuti (1977) for a synthesis. Steedman's condition (g) is more general, holding for many other net output vectors (none of which, however, has any particular economic significance).
9. Prisoners of their own conceptual straightjackets, some recent writers imply that these questions were first posed in the 1970s. That this is not so is apparent from Marx's attention to them at

various places in his work (for example, Marx, 1894, p. 175, 194–5). Whether Marx provided adequate answers is an entirely different question.

10. 'I tend to think,' wrote Maurice Dobb in a private letter to M. C. Howard (in July 1973), 'that when Marx wrote his notes (*only* – that in fact was what they were) in *Theories of Surplus Value* and his draft (only) for Vol. III [of *Capital*], he was still working his way through this subject of rent, seeking a way of explaining it in his own way as *part* of the whole theory of surplus value and price of production, instead of Ricardo's (which saw it only as a *deduction* from total profit for the benefit of the landowners' monopoly). My hunch is that this process of 'thinking through' was still incomplete (that at this stage, e.g., he was still unclear whether absolute rent was an *addition* to Ricardian differential rent or simply *another way* of expounding the theory of rent in the aggregate), and that had he lived to complete it, the exposition and form it assumed would have been substantially different. The very prolixity of the exposition of it in Vol. III, with its multiplication of arithmetical examples and "cases", seems to me to support this supposition that it was unfinished thought, interim notes in the process of thinking-it-through.'

11. In technique 1, 0.25 of a mousetrap and 0.5 units of labour produce one mousetrap; where λ is the value of the mousetrap, we have $\lambda = 0.25\lambda + 0.5$, and $\lambda = \frac{2}{3}$. Technique 2 uses 0.5 of a mousetrap and 0.25 units of labour, so that $\lambda = 0.5\lambda + 0.25$, and $\lambda = \frac{1}{2}$ (Morishima, 1973, p. 189).

12. In the example of the previous note, the average quantity of labour embodied per mousetrap ranges from $\frac{1}{2}$ (when only technique 2 is used), through $\frac{7}{12}$ (when both techniques are used equally intensively), to $\frac{2}{3}$ (when only technique 1 is employed).

13. Note, too, that fixed capital automatically offers a choice of techniques, since machines of different ages are now available. At least some of the problems discussed in section 3, then, are immediately relevant.

14. If wages are paid at the end of the production period, $r = 20$ per cent (Steedman, 1977, p. 156); if they are paid at the beginning, $r = 14.38$ per cent (Morishima and Catephores, 1978, p. 32). In either case the prices of both mousetraps and cheese are positive. Since the rate of profit is positive and equal in both processes, it is not legitimate to object that one process is less 'efficient' than the other (cf. Okishio, 1976, pp. 9–10; Schefold, 1978b, p. 431; and Kurz, 1979, pp. 67–9).

15. This point, to which Steedman might perhaps have given more

emphasis, was first established by Morishima (1973, p. 183). More recently it has been restated by Schefold (1978a, pp. 35—7) and Abraham-Frois and Berrebi (1979, pp. 108—9). Only if values are calculated along quite different lines can negative surplus value be generated (see pp. 169—71).

16. There is a rather clear parallel here (if, for Marxists, an uncomfortable one) with the outcome of the Cambridge controversies of the 1960s. No one knows how frequent cases of reswitching and capital reversal are, whether in theory or in reality, but the mere demonstration of their possibility has, quite rightly, led honest neoclassical economists to a fundamental re-evaluation of their analysis (see Samuelson, 1976).

17. As regards the *analysis* given in the text, there appears to be no difference of substance between Steedman and Morishima, despite the rather acrimonious exchanges in the *Economic Journal* (Steedman, 1976; Morishima, 1976), and the inauspicious remarks in a similar vein at the beginning of Morishima and Catephores (1978, pp. 29—38, 53—8). Steedman had in fact calculated the 'true values' for his example, without using the term itself, and was prevented by space considerations from including them in his 1975 paper; and his endorsement of Morishima's approach (see Steedman, 1977, p. 193, n. 12, and pp. 192—4) was acknowledged in a hasty footnote in Morishima and Catephores (1978, p. 213). As regards the *implications* of the analysis, differences remain.

18. *Socio*-technical, because every production process using human labour is also a social process, and what are often misleadingly described as the 'technical coefficients' of production have an indelible social content.

19. Negative surplus value will be generated by an Armstrong, Glyn and Harrison system, for instance, in circumstances much less unreasonable than those implicit in their own numerical example. Suppose the output of mousetraps in processes 1 and 2 to be 21 and 9 respectively (instead of the 29 and 1 of Table 4.1). Using Armstrong, Glyn and Harrison's method of calculating values, the surplus value produced by the two processes is +0.725 and −0.075, despite the existence of a common, positive rate of profit of $\frac{1}{3}$ in each process.

20. Even some of Steedman's critics have been forced to admit that 'All that are logically prior to a determination of values are knowledge of all *possible* methods of production and of the real wage and the application of the *criterion* of profit maximisation to determine which techniques will be used. *Actual* techniques used, values, prices and the *actual* rate of profit are all then determined

simultaneously . . . While any order of calculation is in principle possible, none is logically prior to any other in Steedman's sense of the term' (Armstrong, Glyn and Harrison, 1978, p. 16; cf. Kurz, 1979, p. 55). So much for the logical priority of values!

21. Morishima is rather more circumspect in his conclusions with (I shall suggest below) some reason.

22. Steedman (1977) does give unnecessary hostage to fortune by his repeated references to the 'physical system', the 'physical conditions of production', and the like, which may easily be mistaken for an assertion that input—output matrices reflect *purely* technical influences. His use (on p. 57) of the term 'technical and social conditions of production' is much more felicitous.

23. Incidentally, this suffices to dispose of Samuelson's charge that the transformation of values into prices is merely a process of rejecting falsehood and replacing it by truth (see Samuelson, 1970; King, 1975). At best it amounts to the replacement of *one theory by another*, and Samuelson supplies no criterion for judging between them.

24. See Steedman (1977, pp. 113—15), for a brief discussion of circulation processes.

25. To the effect that the monopolisation of industries producing wage goods *does* affect real wages (Marx, 1894, pp. 839—40). If we give Marx the benefit of the doubt, and interpret this as referring to all industries *directly or indirectly* engaged in the production of wage goods (that is, to 'basic commodities' in general), then Marx's position is easier to support, though Conditions 3b and 3c must then be abandoned from the outset. The frequent references in Marx's writings to the temporary depression of real wages below the value of labour-power should also be noted.

26. See, for example, Howard and King (1975, pp. 68—70), my share in which I am inclined to recant on this point.

27. Again, see Steedman (1977, pp. 180—1) for a partial exception.

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Another Look at the Labour Reduction Problem in Marx

Mark Blaug

When Ronald Meek published his *Studies in the Labour Theory of Value* in 1956, its undogmatic tone, its obvious depth of knowledge in the history of economic thought, and its heroic attempt to bring Marx up to date in relation to problems of monopoly immediately placed it among the two or three best expositions of Marxian economics in the English language. The book was republished in 1973 with a new and long introduction, which gave striking witness to the stimulating impact of Sraffa on orthodox Marxism. Ronald Meek never ceased to be a Marxist, but in this introduction he candidly admitted that there were serious, unsolved problems in the standard versions of Marx. Among the many unsolved problems he included the so-called 'skilled labour reduction problem':

> I would now be rather more critical of certain aspects of Marx's treatment of the quantitative side of the value problem. His treatment of the unskilled labour problem (below, pp. 167–73), although suggestive enough, is rather fragmentary and incomplete, and there seems little doubt that he underestimated the importance of the problem (Meek, 1973, p. xvi).

This is all Meek said and we are left wondering what would constitute a complete, satisfactory treatment of the reduction problem from the Marxian standpoint.

Marx's treatment of the problem of differentiated labour has been frequently criticised by Marxists and anti-Marxists alike[1] but the prevailing view among modern Marxists is that, whatever Marx himself may have said, the labour reduction problem is capable of being solved, at least in principle, in the general spirit of the Marxian system. Such, I am sure, was Ronald Meek's own view, even in the later years of his life. Critics of Marx, however, generally regard the labour reduction problem as the Achilles heel of Marxian economics and they would heatedly deny that the standard solutions of the problem can be reconciled with other leading features of the Marxian system. I share that view. My only justification for writing this essay is not to restate objections long familiar to Marxologists but, I hope, to throw fresh light on the nature of the difficulties.

1 STATING THE PROBLEM

Marx argued that the value of commodities is determined by the 'socially necessary' labour-time required to produce them and that these labour costs are countable in units of common, abstract labour, skilled labour being treated as so many multiples of common labour. These multiples must be construed as purely technical conversion coefficients and not simply as earnings differentials between different types of labour, because it is obviously illegitimate to invoke wage rates in what, after all, purports to be an explanation of how prices are determined. So long as labour is only differentiated in terms of acquired skills, there is no problem: we can assume that such skills are produced in a private 'training industry' at cost-covering prices, in which case labour skills are simply means of production, like machines, that are produced and reproduced at the going rate of profit. In other words, the time-consuming production of skilled labour raises no separate difficulties for the labour theory of value that are not also raised by the time-consuming production of machines.

The argument breaks down, however, the moment we concede that labour is also differentiated in terms of 'ability', regardless of whether those ability differences are innate or

whether they are due entirely to family rearing. Such 'ability' differences simply cannot be interpreted as given technical coefficients in a notional industry called the 'family', producing an output in accordance with the principle of equal profitability. We could, of course, argue that all differences in native ability are randomly distributed among individuals, who in turn are randomly distributed among industries, in consequence of which these differences have no impact on the relative prices of commodities produced by different industries. In so far as there are industries with high concentrations of exceptionally talented individuals (sports, the performing arts, and perhaps even education), these industries must then be set aside as frank exceptions to the labour theory of value on the same grounds as non-reproducible goods in general. Marx himself never employed this argument, and indeed virtually ignored the problem of ability differences, but modern Marxists[2] have frequently adopted this escape route, in effect treating different types of labour as differing only in certain cognitive skills that have been acquired in a training course.

There is a third difficulty in the standard interpretation of the labour reduction problem which is rarely given its proper due in the Marxist literature (but see Howard and King, 1975, pp. 130–2): it is that jobs within and between industries differ not only in their pecuniary but also in their non-pecuniary attributes, and that individual workers cannot be assumed to be totally indifferent about the various mixes of these attributes associated with particular jobs. Indeed, in a famous chapter of Book I of the *Wealth of Nations*, Adam Smith argued that some jobs require more manual or mental skill, more endurance, more risk of injuries, more indifference to routine, and more irksome responsibility than others; in addition, jobs also differ in 'agreeableness' and in the variance of both earnings and full-time opportunities which they offer. For that reason, he denied that a competitive labour market tends to equalise the rate of wages for labour regarded as homogeneous by employers; what it equalises is the 'net advantages' of different jobs to individual workers. Be that as it may, we must either argue that workers lack the power to make occupational choices, or that the non-pecuniary fringe

benefits of different jobs are more or less uniformly distribu-
ted among the major sectors of the economy. In so far as
there are industries like agriculture that do rely more heavily
on payments in kind rather than payments in money, we
must once again treat them openly as exceptions to the
labour theory of value.

Marx made at least oblique references to all three of the
difficulties in the labour reduction problem outlined above.
He clearly treated the first difficulty as the paradigm case of
the labour reduction problem, and in the opening chapter of
volume I of *Capital* he so much as implied that skilled labour-
time is simply the sum of unskilled labour-time plus the total
labour-time expended on training unskilled workers, including
the labour embodied in the output of trainees forgone (Marx,
1976, pp. 135, 305, 435; also *Capital*, III, 1909, pp. 168–9).
Unfortunately, he also said that 'Experience shows that this
reduction [of skilled to unskilled labour time] is constantly
being made' and that such reductions are established by 'a
social process that goes on behind the backs of the producers',
appearing to them as something 'handed down by tradition'
(Marx, 1976, p. 135; also pp. 276, 294–5). A footnote on
the same page explains that the reduction has nothing to do
with relative wages, that, in short, it is a genuine physical
decomposition of skilled labour into its historic unskilled
labour costs. But what is this *social* process of reducing
skilled to unskilled labour in physical terms? Why should
either capitalists or workers care about the value-calculus in
terms of labour-time?[3]

Moreover, in a later portion of volume I, Marx (1976,
p. 305) suddenly announces the 'thesis of the increasing
homogenisation of labour' under capitalism: the distinction
between skilled and unskilled labour is simply an illusion
fostered by custom, which is shortly to disappear; indeed
elsewhere he said that it already had disappeared in America,
'the most modern form of bourgeois society' (Marx, 1970,
p. 210). In other words, labour may have been heterogeneous
in the past but capitalism tends constantly to erode all dif-
ferences between types of labour by the introduction of skill-
saving processes, so that purely homogeneous, common
labour represents the appropriate abstraction that corresponds

to capitalism at its highest stage of development. Thus the 'social process' that permits heterogeneous labour to be commensurable in physical terms at early stages of capitalist development is destined to be eroded by the very process of capital accumulation. If this 'thesis of the increasing homogenisation of labour' is to be taken seriously, it amounts in effect to the prediction that earnings differentials will gradually narrow and eventually disappear under capitalism.

Now, undoubtedly, factor substitution acts constantly to overcome shortages of skilled labour by a process of deskilling, but, on the other hand, technical progress frequently acts in the opposite direction by raising the skill requirements of new products and processes. It is a moot question whether the labour force has in fact become more or less physically differentiated in the process of industrialisation, but certainly the educational explosion of the last thirty-five years and the relative constancy of inter-occupational wage differentials in advanced countries over the last fifty and even one hundred years suggest the very opposite of Marx's belief in the increasing homogenisation of labour.[4] This is not a question we can settle here, but certainly Marx's treatment of the labour reduction problem leaves many loose ends that he never tied together.

Is it really true that 'ability' differences are only important in certain restricted areas of economic activity that can be safely ignored at the high level of abstraction of the labour theory of value? Are workers really indifferent between different kinds of work, or compelled to suppress the differences they do care about because of the fear of unemployment? Is occupational mobility simply a vestige of the past, a sign of underdevelopment? But if so, how are we to account for the undeniable fact that there is always wage dispersion even for unskilled labour in a single geographical labour market?

Let us take these two sets of questions in reverse order.

2   THE OCCUPATIONAL MOBILITY OF WORKERS

Marxists usually ignore the Smithian theorem of the equalisation of 'net advantages' in labour markets, assuming implicitly

that the elasticity of supply of every type of labour is infinite, thus eliminating the influence of demand on the determination of relative wages. When they do recognise the fact that different workers have different preferences for the pecuniary and non-pecuniary aspects of work, they usually rely on the concept of 'the industrial reserve army' to get rid of the difficulty.[5] In so doing, however, they only avoid Scylla by encountering Charybdis. The labour theory of value requires the assumption that workers move freely between different jobs so as to equalise both the rate of wages of the same type of labour and certain non-pecuniary attributes of the jobs taken up, such as the intensity of effort and the length of the day over which the effort is expended. Without this assumption, there is no warrant for the fundamental Marxist belief that every 'productive' worker generates surplus value at a rate that is uniform throughout all industries and all occupations.

The argument goes like this: if labour is homogeneous in quality, there will be one ruling wage rate in the economy; and if workers prefer a shorter to a longer working day, and if they care nothing about the other aspects of a job, they will choose jobs and firms in such a way that the length of the working day is everywhere equalised; finally, according to the labour theory of value, a given quantity of homogeneous labour always produces an equal quantity of value; it follows that every 'productive' worker in the economy must spend the same number of hours reproducing the value of his wage bundle and hence the same number of hours working to produce a surplus value for the capitalist who employs him; thus, as a by-product of competition in the labour market on the part of both capitalists and workers, the rate of surplus value is equalised throughout the economy. Q E D

The 'theorem of the uniform rate of surplus value' has been expounded by a large number of Marxist commentators,[6] but its origins go back to Marx himself.[7] Clearly, it calls for workers willing and able to move between jobs in search of the highest wage and the shortest working day, which is as much as to say that there is at least one non-pecuniary characteristic of jobs that makes workers 'vote with their feet'. It follows that the price of different types of labour does to

that extent depend on both supply and demand, rather than simply on ratios of labour embodied in the production of vocational skills, and, hence, that the labour reduction problem cannot be solved along traditional lines. To put it in a nutshell: the 'theorem of the uniform rate of surplus value' requires effective occupational mobility, but effective occupational mobility contradicts the standard solution to the labour reduction problem, according to which relative wages reflect only the relative labour-times embodied in the production of vocational skills (see Wolfson, 1966, pp. 49–56, 80–2; Morishima, 1973, pp. 180, 191–3).

Alternatively, of course, we could give up the 'theorem of the uniform rate of surplus value', allowing the rate of surplus value to differ either between industries or between stated categories of workers. But if we allow it to differ between industries, we would have to know precisely how it varied between industries in order to calculate the total mass of surplus values that is said by Marx to mark an upper boundary on the total profits that can be earned by capitalists. Moreover, if we admit that these unequal rates of surplus value in different industries are in any way functionally related to the varying amount of machinery that workers are equipped with – a conclusion that would be difficult to resist once we had abandoned the 'theorem of the uniform rate of surplus value' – we threaten Marx's still more fundamental theorem that attributes surplus value solely to living labour, irrespective of the amount of 'dead labour' with which it is combined.[8]

If, on the other hand, we permit the rate of surplus value to differ, not between industries but between stated categories of workers, we may easily encounter circumstances in which the rate for some categories is actually negative, meaning that these workers exploit capitalists rather than the other way around, and, in general, it will be true in this case that a certain proportion of workers will be exploited by other workers as well as by capitalists. However, some radical American economists with Marxist leanings have not been deterred by these uncomfortable implications and have claimed that, indeed, the labour market under capitalism is always segmented into non-competing sexual, racial and ethnic groups, so that there are as many rates of surplus value as

there are separate segments in the labour markets, in consequence of which some workers end up exploiting others (Bowles and Gintis, 1977).

In this latter version of Marx, the Marxian theory of profits as surplus value created by living labour is reduced to the innocuous theorem that the rate of profit is positive if and only if at least one rate of surplus value of a particular labour segment is positive (Bowles and Gintis, 1977, p. 190; see also Bowles and Gintis, 1978), which in turn implies nothing more than that at least one labour segment produces a positive net physical product which is not entirely handed over to workers. Even Morishima (1978), whose sympathy for Marx's ideas is, to say the least, ambiguous, finds the notion of unequal rates of surplus value across different labour segments too radical a departure from both the spirit and the letter of Marx to be acceptable as a way round the labour reduction problem.

It is important to note that Bowles and Gintis simply bypass the reduction problem because they deduce the set of equilibrium prices directly from a physical specification of the input—output matrix and an exogenously given vector of wage rates for heterogeneous labour without going through the intervening Marxian value system defined in terms of direct labour-time. In short, they follow Sraffa rather than Marx, as a result of which they end up with a Marxism that is shorn of the labour theory of value. What meaning, then, can be assigned to expressions involving 'the rate of surplus value' is anybody's guess; labour-time in a Sraffian treatment of Marx is simply a unit of social accounting and nothing whatever can be deduced about the nature of profits from an accounting convention, as some Sraffian Marxists are the first to admit (Steedman, 1977, pp. 59, 206). Suffice it to say that there simply is no labour reduction problem in Sraffa (Steedman, 1977, pp. 91—3, 204—5).

3   ABILITY DIFFERENCES BETWEEN WORKERS

We turn back now to the problem of ability differences, which have long been recognised by Marxists as creating

exceptions to the labour theory of value. The outstanding question is whether they can in fact be ignored for an analysis focusing on commodities produced in the manufacturing 'heartland' of a capitalist economy. The Marxist literature abounds in statements which assert the unimportance of ability differences among workers in most industries and the constant tendency of mechanisation to eliminate such differences as still exist. Unfortunately, the only 'abilities' that appear to be recognised are those involving physical strength, manual dexterity, and vocationally specific cognitive and artistic skills.[9] This is very odd because other Marxists, such as Edwards (1976) and Gintis (1971) have shown fairly conclusively that psycho-motor and cognitive skills do not explain much of the differences in pay between workers in the same industry; these differences seem to depend principally on differences in the affective behavioural traits of workers, such as docility, compliance, initiative, achievement-drive, etc., which are probably the joint result of their home background and the schooling they have received. There is, however, absolutely no evidence that these kinds of affective 'abilities' are becoming any less significant as time passes, or that their incidence is confined to certain exceptional service and entertainment industries. Indeed, it is precisely for that reason that Bowles and Gintis reject the traditonal Marxian procedure of reducing differences among workers to differences in the amount of labour embodied in the production of acquired skills.[10] As a matter of fact, the standard Marxian solution of the labour reduction problem bears an amazing likeness to certain extreme versions of human-capital theory in orthodox economics in which all wage differences are regarded as being solely due to education-cum-training costs.

I say advisedly 'certain extreme versions' because, on balance, recent work in human-capital theory will not sustain the thesis that 'abilities do not matter' for purposes of explaining the pay structure (see Blaug, 1976, pp. 842–3). Now, it is perfectly true that Marx did not intend to explain wage differences and that the labour reduction problem deliberately avoids reference to wage rates. Nevertheless, evidence about the distribution of abilities, and about the nature of these abilities, forms an essential element in the

research programme of human-capital theorists and it is to this evidence that we must look for an answer to the question of the significance of ability differences.

When Böhm-Bawerk and Hilferding debated the labour reduction problem at the turn of the last century, very little was known about the structure of relative wages, and particularly the personal characteristics of workers in relation to differential rates of pay. Thus Böhm-Bawerk (1949, p.85) boldly asserted that earnings differentials cannot in fact be explained solely by differences in the costs of training, which is perfectly true, but he had no basis other than casual empiricism for making that statement. But since then the rise of human-capital theory has generated a vast body of evidence about the determinants of the distribution of earnings in terms of such individual characteristics as age, years of work experience, length of schooling, quality of schooling, occupational status, community of residence, family origins, and even measured IQ at an early age. And yet when we examine the numerous writings of Marxists in recent years on the labour reduction problem we do not find a single reference to this new source of data with which to test the hypothesis that differences in the abilities of different workers make no difference whatsoever either to job performance or to wage rates in such sectors as manufacturing, transportation, services, etc. Moreover, the new data strongly suggest that the implicit private rate of return to the 'training industry', which of course includes the whole of the formal education system, is not in fact equalised with the rate of profit on business capital (Blaug, 1976, pp. 838–9), implying that vocationally useful skills are not simply produced like 'peculiar machines' at the going rate of profit; in short, even if we disregard ability differences between workers, the labour reduction problem is only solved in the abstract. Besides, as I said, these ability differences, whether due to nature or to nurture, show up as significant in all the 'earnings functions' that have poured out of the human-capital research programme, which is a further reason for doubting the classic solution to the labour reduction problem.

It will not do to argue that all this is irrelevant because the Marxist argument refers only to 'productive' labour, whereas

the earnings functions of human-capital theory refer to all labour earning either weekly wages or monthly salaries. It is a simple matter to extract from the literature a set of earnings functions for wage-earners in manufacturing, all of whom necessarily fall within the Marxist category of 'productive labour', and even these show that wage differentials are, at least in part, due to ability differences even within the same occupational category. Nor can it be argued that these ability differences may mean something for pay differentials but that they are irrelevant for the production of real output; whenever physical measures of job performance are employed, it turns out once again that different workers perform at different rates in carrying out the same tasks and that these differences are best explained by differences in their behavioural traits (Gintis, 1971).

4   CONCLUSIONS

The labour reduction problem can only be solved at a stratospheric level of abstraction that totally ignores real-world evidence about the determinants of relative wages, the rates of return to educational and training activities, and the patterns of occupational mobility. Indeed, what stands out about the entire debate surrounding the reduction problem is the facility with which the participants in that debate switch between levels of discourse at various stages in their argument: one moment we are adding farm labourers to coal miners in terms of their embodied labour-hours and in the next breath we are justifying this exercise by pontifical pronouncements about the effects of automation in basic industry; sometimes we are told that workers differ only in certain acquired skills, and a minute later we are assured that exceptions to that rule are largely confined to the peripheries of the economic system; for some purposes, workers are seen to choose between occupations in accordance with their different inclinations, and for others it is denied that they have any choice at all; and so forth. Such confusions are a manifestation of the fact that the labour reduction problem has gradually become a purely formal puzzle in the working

out of the Marxian paradigm, while all the interesting historical and empirical questions about labour markets have been allowed to become the exclusive province of orthodox economists. What determines relative wages? Why are inter-industrial and inter-occupational pay differentials so remarkably stable over time? Why is labour training so valued that workers are frequently willing to pay for it themselves via lower wages during the training period? Why is formal schooling capable of raising a worker's earning potential? What governs the mobility of workers between occupations? And why is technical progress sometimes skill-using rather than skill-replacing? Marxists have been so busy solving analytical brain-teasers (like the labour reduction problem) which they have themselves created that they have sorely neglected the task of studying how capitalist economies actually work.

NOTES TO CHAPTER 5

1. For reference to the history of the debate, see Rowthorn (1974, footnote 1) and Roncaglia (1974, footnotes 10–12).
2. See, for example, Meek (1973, pp. 172–3), Rowthorn (1974, p. 40) and Howard and King (1975, pp. 130–2).
3. Morris and Lewin (1973–4) interpret the 'social process' to be a traditional sense of the justice of the inherited pay structure which is then translated into 'an objective social system of occupational equalization forces' defined in terms of labour time. No doubt, there is such a sense of the justice of past earnings differentials but they never explain why these should come to be converted by anybody into a 'job evaluation' system of reckoning in units of common labour.
4. A recent book by Braverman (1974) documents the remorseless process of deskilling in the history of the American economy and, by blandly ignoring the forces that act in the opposite direction, implies the historical validity of the 'thesis of the increasing homogenisation of labour'.
5. Thus Howard and King (1975, p. 132) declare: 'the weight of the industrial reserve army is sufficient, in all normal circumstances, to ensure the suppression of individual preferences. Thus workers take jobs which they actively dislike (at the prevailing wage) in order to exist. Marx himself noted that the reduction of skilled to unskilled labour requires, *inter alia*, "indifference of the labourer to the nature

of his labour", and "the elimination of all vocational prejudices among labourers" . . . And according to his theory of alienation, workers in capitalist society "shun work like the plague", as much because it entails subordination of the labourer to the capitalist as because of the intrinsic characteristic of specific jobs. Within very broad limits, men shun *all* types of work equally.'

6. See, for example, Wolfson (1971, pp. 19, 21), Morishima (1973, p. 52), Baumol (1974, p. 55n), Howard and King (1975, p. 26) and Harris (1978, p. 84).

7. 'If capitalists employing unequal amounts of living labour are to produce unequal amounts of surplus-value, it must be assumed, at least to a certain degree, that the intensity of exploitation, or the rate of surplus-value, are the same, or that any existing differences in them are balanced by real or imaginary (conventional) elements of compulsion. This would presuppose a competition among the labourers and equilibration by means of their continual migration from one sphere of production to another. Such a general rate of surplus-value — as a tendency, like all other economic laws — has been assumed by us for the sake of theoretical simplification. But in reality it is an actual premise of the capitalist mode of production' (Marx, 1909, p. 206).

8. It is not clear that this implication is fully appreciated by some Marxist writers (Rosdolsky, 1977, pp. 539—41; Desai, 1979, p. 51) who are perfectly willing to give up the 'theorem of the uniform rate of surplus value'.

9. Thus Sweezy (1942, p. 44) writes: 'So far as the vast majority of productive workers is concerned, specialized talents are not of great importance; the qualities which make a good worker—strength, dexterity, and intelligence — do not differ greatly from one occupation to another. No more than this need be granted to establish the essential commensurability of simple and skilled labour.' Similarly, Rowthorn (1974, p. 40) declares: 'Mechanisation, automation and other changes in methods of production have already reduced dramatically the importance of such special capabilities as great physical strength or manual dexterity, and further changes in this direction will continue to occur in the future. Specific intellectual and artistic natural ability will doubtless remain important in certain restricted areas of economic activity. But their overall significance is not and probably never was very great.' Roncaglia (1974, pp. 9—10) endorses Rowthorn and adds: 'the reality of mass production undoubtedly confirms Marx's approach [of assuming a random distribution of abilities among workers and industries] as we remember that all wage labourers are in substantially the same position as they face capital'. (Marx, incidentally, did not assume a

random distribution of abilities among workers and industries – he simply said nothing about ability differences.)

10. 'A wide variety of statistical evidence suggests that skills, at least as conventionally measured by training and cognitive achievement scores, are a weak determinant of occupational position, job performance and income. The importance of age, race and sex differences has been quite widely demonstrated ... We have shown that even the higher income and privileged job assignments enjoyed by more schooled workers, though much celebrated by the human capital school, cannot be explained by the cognitive skills or on-the-job training associated with higher levels of education and longer job experience' (Bowles and Gintis, 1977, p. 180).

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CHAPTER SIX

Competition

John Eatwell

> only through the principle of competition has political
> economy any pretension to the character of a science.
> So far as rents, profits, wages, prices, are determined by
> competition, laws may be assigned for them. Assume
> competition to be their exclusive regulator, and principles
> of broad generality and scientific precision may be laid
> down, according to which they will be regulated (John
> Stuart Mill, *Principles of Political Economy*, 1848, p. 242).

In all versions of economic theory 'competition', variously
defined, is a central organising concept. Yet the relationship
between different definitions of competition and controver-
sies in the theory of value has not been widely appreciated. It
is the purpose of this essay to investigate this relationship.

The substance of recent controversies in the theory of
value has been significantly clarified by the distinction drawn
by Pierangelo Garegnani (1976) between, on the one hand,
what he calls the *method* of economic analysis, and, on the
other hand, economic theory *per se*. The traditional method
has been to pose the study of the behaviour of a capitalist
market economy in terms of the long-period positions and the
associated uniform rates of profit[1], which the persistent
forces acting in the economy will tend to establish. This
method is independent of the theory which may be used to
explain the determination of the long-period position, as may
be seen from the fact that essentially the same method was
the basis of economic analysis both before and after the great
change in economic theory in the late nineteenth century.

In this essay I will attempt to locate the role of the long-period method in the development of both classical and neo-classical theories of value,[2] and hence throw some critical light on the change in method which has taken place with the introduction of the notion of 'intertemporal equilibrium'. This will involve relating the long-period and 'intertemporal' methods to the object which they are both intended to characterise – the operations of a capitalist market economy; and to the process which validates that characterisation – competition.[3]

The economic organisation of industrial capitalism is not immediately perceptible. As a form of economy in which production and distribution proceed by means of a generalised process of exchange (in particular by the sale and purchase of labour) it possesses no obvious direct mechanisms of economic and social co-ordination. Yet, in so far as these operations constitute a system, they must be endowed with some degree of regularity, the causal foundations of which may be revealed by analysis. The first steps in economic investigation which accompanied the beginnings of industrial capitalism consisted of a variety of attempts to identify such regularities, often by means of detailed description and enumeration, as in the works of Sir William Petty, and hence to establish the dominant causes underlying the behaviour of markets. But what was required was not simply the description and classification which necessarily precedes analysis, but abstraction, the transcendence of political arithmetic.[4]

The culmination of the search for a coherent abstract characterisation of markets, and hence the foundation of modern economic analysis, is to be found in chapter 7 of Book I of Adam Smith's *Wealth of Nations* – 'Of the natural and market price of commodities'. In this chapter Smith presented the first satisfactory formulation of the regularity inherent in price formation. The idea, partially developed earlier by Cantillon, and by Turgot in his discussion of the circulation of money, was that

> There is in every society . . . an ordinary or average rate of both wages and profits . . . When the price of any commodity is neither more nor less than what is sufficient to

pay the rent of land, the wages of labour, and the profits
of stock employed . . . according to their natural rates, the
commodity is then sold for what may be called its natural
price.

and that

> The natural price . . . is, as it were, the central price, to
> which the prices of all commodities are continually gravita-
> ting. Different accidents may sometimes keep them sus-
> pended a good deal above it, and sometimes force them
> down somewhat below it. But whatever may be the obstacles
> which hinder them from settling in this centre of repose
> and continuance, they are constantly tending towards it
> (Smith, 1961, p. 65).

Thus the natural price, that associated with ordinary or
average rates of wages, rents and profits,[5] encapsulates the
persistent element in economic behaviour. And that persis-
tence derives from the ubiquitous force of competition; or,
as Smith put it, the condition of 'perfect liberty' in which
'the whole of the advantages and disadvantages of the dif-
ferent employments of labour and stock must . . . be either
perfectly equal or continually tending to equality' (p. 111),
for the natural price is 'the price of free competition' (p. 68).
    The relationship between competition and the establish-
ment of what Petty called 'intrinsic value' had been presented
in the works of Petty, Boisguillebert, Cantillon and Harris as
the outcome of rival bargaining in price formation, competi-
tion being the greater when the number of bargainers was
such that none had a direct influence on price (Meek, 1956,
pp. 27–31; McNulty, 1967). Similarly, although Quesnay
expressed the formation of competitive prices as being, in his
ringing phrase, 'independent of men's will . . . far from being
an arbitrary value or a value which is established by agreement
between the contracting parties' (in Meek, 1962, p. 90), and
in his analysis of the reproduction of surplus laid the founda-
tions for the characterisation of social and economic processes
as law-governed (Meek, 1965), he did not relate the organisa-
tion of production to the formation of prices in competitive

markets. Consideration of that relationship required the development of a general conception of the role of capital, and with it the notion of a general rate of profit formed by the competitive disposition of capital between alternative investments.

A significant step in this direction was made by Turgot, who both conceived of the process of production as part of the circulation of money:

> We see . . . how the cultivation of the land, manufactures of all kinds, and all the branches of commerce depend upon a mass of capitals, or movable accumulated wealth, which, having been first advanced by the Entrepreneurs in each of these different classes of work, must return to them every year with a regular profit . . . It is this continual advance and return of capitals which constitutes *what ought to be called the circulation of money* (Turgot, 1973, p. 148).

and saw that the structure of investments would tend to be that which yielded a uniform rate of profit:

> It is obvious that the annual products which can be derived from capitals invested in these different employments are mutually limited by one another, and that all are relative to the existing rate of interest on money (Turgot, 1973, p. 70).

However, Turgot neither related the determination of the rate of profit to production in general (as Meek (1973, p. 26) pointed out, Turgot 'accepted the Physiocratic idea that the incomes of the industrial and commercial classes were "paid" by agriculture') nor developed the conceptual framework which linked the formation of prices and of the rate of profit to the over-all organisation of the economy. These were to be Smith's achievements:

> If . . . the quantity brought to market should at any time fall short of the effectual demand, some of the component parts of its price must rise above their natural rate. If it is rent, the interest of all other landlords will naturally

prompt them to prepare more land for the raising of this commodity; if it is wages or profit, the interest of all other labourers and dealers will soon prompt them to employ more labour and stock in preparing and bringing it to market. The quantity brought thither will soon be sufficient to supply the effectual demand. All the different parts of its price will soon sink to their natural rate, and the whole price to its natural price (Smith, 1961, p. 65).

So in a competitive market there will be a tendency for the actual prices (or 'market prices', as Smith called them) to be relatively high when the quantity brought to market is less than the effectual demand (the quantity that would be bought at the natural price) and relatively low when the quantity brought to market exceeds the effectual demand. This working of competition was known as the law of supply and demand. The workings of competition which constitute the 'law' do not identify the phenomena which *determine* natural prices. Thus the *law* of supply and demand should not be confused with supply and demand *theory*, i.e. the neoclassical theory of price determination which was to be developed one hundred years later. Nor should Smith's discussion of the tendencies of concrete market prices be confused with abstract supply and demand functions.

Adam Smith's conception of 'perfect liberty' consists of the mobility of labour and stock between different uses (1961, pp. 112, 132–3); mobility is necessary for the establishment of 'an ordinary or average rate both of wages and stock' and hence for the gravitation of market prices towards natural prices. Smith identifies four reasons why market prices may deviate 'for a long time together' above the natural price, creating differentials in the rate of profit, all of which involve restriction of mobility (1961, pp. 67–70):

(a) extra-demand can be 'concealed', though 'secrets of this kind . . . can seldom be long kept';
(b) secret technical advantages;
(c) 'a monopoly granted either to an individual or to a trading company'
(d) 'exclusive privileges of corporations, statutes of apprenticeship, and all those laws which restrain, in particular

employments, the competition to a smaller number than might otherwise go into them'.

For Smith there is some similarity in the forces acting on wages and on profits which derives from his conceiving of the capitalist as being personally involved in the prosecution of a particular trade or business. So the rate of profit, like the rate of wages, may be differentiated between sectors by 'the agreeableness or disagreeableness of the business', even though 'the average and ordinary rates of profit in the different employments of stock should be more nearly upon a level than the pecuniary wages of the different sorts of labour' (1961, p. 124). Landlords, capitalists and workers are all active agents of mobility. In Ricardo's discussion the emphasis shifted towards the distinctive role of capital:

> It is, then, the desire, which every capitalist has, of diverting his funds from a less to a more profitable employment, that prevents the market price of commodities from continuing for any length of time either much above, or much below their natural price (Ricardo, 1951, p. 91).

Ricardo used the term 'monopoly price' to refer to commodities 'the value of which is determined by their scarcity alone', such as paintings, rare books and rare wines (pp. 249—51) which 'have acquired a fanciful value', and he argued that for 'Commodities which are monopolised, either by an individual, or by a company . . . their price has no necessary connexion with their natural value' (p. 385). His analysis of value and distribution is accordingly confined to 'By far the greatest part of those goods which are the objects of desire . . . such commodities only as can be increased in quantity by the exertion of human labour, and on the production of which competition operates without restraint' (p. 12).

For Marx competition is synonymous with the generalisation of capitalist relations of production. Competition is thus related to the rise to dominance of the capitalist mode of production:

> While free competition has dissolved the barriers of earlier relations and modes of production, it is necessary to ob-

serve first of all that the things which were a barrier to it were the inherent limits of earlier modes of production, within which they spontaneously developed and moved. These limits became barriers only after the forces of production and the relations of intercourse had developed sufficiently to enable capital as such to emerge as the dominant principle of production. The limits which it tore down were barriers to its motion, its development and realisation. It is by no means the case that it thereby suspended all limits, nor all barriers, but rather only the limits not corresponding to it ... Free competition is the real development of capital (Marx, 1973, pp. 649–50).

And as capitalism itself develops so does competition:

> On the one hand ... [capital] creates means by which to overcome obstacles that spring from the nature of production itself, and on the other hand, with the development of the mode of production peculiar to itself, it eliminates all the legal and extra-economic impediments to its freedom of movement in the different spheres of production. Above all it overturns all the legal or traditional barriers that would prevent it from buying this or that kind of labour-power as it sees fit, or from appropriating this or that kind of labour (Marx, 1976, p. 1013).

The concentration of capital (increasing unit size of firm in the process of accumulation) and, in particular, the centralisation of capital (cohesion of existing capitals) destroys and *recreates* competition. Competition is one of the most powerful 'levers of centralisation', and

> The centralisation of capitals, or the process of their attraction, becomes more intense in proportion as the specifically capitalist mode of production develops along with accumulation. In its turn centralisation becomes one of the greatest levers of its development (Marx, 1976, p. 778n).

Like Smith and Ricardo, Marx relates the development of

competition to the establishment of the general rate of profit:

> What competition, first in a single sphere, achieves is a single market value and market price derived from the various individual values of commodities. And it is competition of capitals in various spheres, which first brings out the price of production equalising the rates of profit in the different spheres. The latter process requires a higher stage of capitalist production than the previous one (Marx, 1967, p. 180).

It is in his conception of the circuit of capital that Marx best portrays capitalist competition. The image is one of capital as a homogeneous mass of value (money) seeking its maximum return. Profits are created by embodying capital in commodity form in the process of production, the commodity outputs of which must be realised, i.e. returned to the homogeneous money form to be reinvested. Competition is thus characteristic of the capitalist process of accumulation; mobility and change are two aspects of the same phenomenon.

Marx's general conception of capital as a system corroborates Quesnay's notion of the economy operating 'independent of men's will'. This does not mean that there may not be circumstances in which individual capitals exercise some control on particular markets — indeed such limitations may be necessary for the accumulation process to proceed in certain lines. Capital removes only such barriers as *limit* its accumulation. The market control exercised in some lines of modern industry is not necessarily a limitation but may be a prerequisite of production on an extended scale. Such controls do not contravene the laws of competition, which with the development of capitalism, and in the absence of institutional intervention, operate over an ever-widening field. Aggregate capital flows discipline the actions of individual capitals, and hence endow the system with the regularity manifest in the perpetual tendency, successively contradicted and recreated, towards a general rate of profit and the associated prices.

Competition, identified in its complete sense by Marx, but essentially unchanged from the formulation by Smith, not only established the object of analysis, natural prices and the

general rate of profit, but made meaningful analysis possible, since it allowed the operations of the capitalist economy to be characterised in a manner which permitted theoretical statements of general validity to be made about them.

Theory proceeds by the extraction from reality of those forces which are believed to be dominant and persistent, and the formation of these elements into a formal system, the solution of which is to determine the state or magnitude of the variables under consideration. It is obvious that the solution will not, except by a fluke, correspond to the actual magnitudes of the variables ruling at any one time, for these will be the outcome not simply of the elements grouped under the heading 'dominant and persistent', but also of the multitude of other forces excluded from the analysis as transitory, peculiar or specific (lacking general significance) which may, in any given situation, exert a more or less powerful effect. None the less, the practice of analysis necessarily embodies the assumption that forces comprising the theory *are* dominant, and that the determined magnitudes will, on average, tend to be established. In any satisfactory analytical scheme these magnitudes must be centres of gravitation, capturing the essential character of the phenomena under consideration.

The importance of Smith's formulation will now be apparent. Satisfactory theory cannot exist in a vacuum. Simple labelling of forces as dominant is not enough. These forces must operate through a process which establishes their dominance and through which the 'law-governed' nature of the system is manifest.[6] That process is competition, which both enforces and expresses the attempts of individual capitals to maximise profits. Thus an important aspect of the behaviour of a capitalist market economy may be characterised at a sufficient level of generality, as the general rate of profit with associated normal prices, to permit the formulation of general causal statements, i.e. to permit analysis. Without this step, which constitutes the establishment of what was called above the *method* of economic analysis, it would not have been possible to develop any form of general economic *theory*.

The Classical theory of value and distribution developed as a series of attempts to provide a logically coherent theory

of the rate of profit and hence of natural prices (Garegnani, 1960; forthcoming). Taking as data

(a) the size and composition of social output,
(b) the technique in use (conditions of reproduction), and
(c) the real wage

Ricardo argued that the rate of profit was determined by the ratio of surplus to means of production, where surplus is defined as output less requirements of reproduction, i.e. means of production used up and wages, evaluated with respect to the conditions of reproduction under the least favourable 'socially necessary' circumstances which consequentially pay no rent. The problem of value presented itself as the search for a means of expressing the heterogeneous aggregates of surplus and means of production in the numerator and the denominator of the ratio in homogeneous terms. The most consistent approach utilised the labour theory of value. But the deficiencies of this approach threatened to undermine the whole system. The closest that the Classical economists came to a satisfactory solution is that presented by Marx in volume III of *Capital*, in which he first uses the labour theory of value to determine the magnitude of the ratio of surplus to means of production and then argues that the competitive formation of the general rate of profit contradicts the proposition that commodities exchange at their labour value.

But this sequential solution is unsatisfactory. The argument of the surplus approach to the theory of value and distribution is that the set of normal prices is determined by the conditions of reproduction and the manner in which the surplus is distributed. But if the surplus is to be distributed as a rate of profit, the value of the means of production used in each line must be known before the surplus may be 'allocated' amongst them. Hence the rate of profit and normal prices must be determined simultaneously (Sraffa, 1960, p. 6). Once the problem had been posed in terms of simultaneous determination by Dmitriev and Bortkiewicz, the Classical data were shown to be sufficient for the unique determination of the rate of profit. Piero Sraffa (1960) provides clarification and generalisation of the Classical method, and

shows it to be robust in the face of a change in the data from a given real wage to a given rate of profit.

The Classical system, the surplus theory, provides a logically consistent explanation of the determination of the general rate of profit and hence of natural prices (prices of production). The Classical achievement is thus composed of two independent elements: (a) the characterisation of the object of the theory of value, i.e. the construction of an analytical method; and (b) the provision of a theory for the determination of that object. Underlying the former is the concept of gravitation imposed by competition, and underlying the latter the concept of gravitation inherent in theoretical abstraction. To be a viable alternative any other system of analysis must not simply provide a different theory but also achieve a similar congruence with the traditional method.

The development in the final quarter of the nineteenth century of what was to become known as the neoclassical theory of value and distribution attempted to provide an alternative to the Classical theory embroiled in the logical difficulty of finding a measure of value on which a coherent theory of the rate of profit might be based and sullied by unsavoury associations with radicalism and Marxism. But despite the dramatic change in theory that was to be heralded by the works of Jevons, Menger and Walras, the method of analysis which characterised the object the theory was to explain stayed fundamentally the same; the theory was an alternative explanation of the same phenomena. Marshall relabelled natural prices 'long-run normal prices', and declared that, as far as his discussion of value was concerned 'the present volume is chiefly concerned . . . with the normal relations of wages, profits, prices, etc., for rather long periods' (1920, p. 315).[7] The same continuity of the method may be found in the work of Walras (1954, pp. 224, 380), Jevons (1970, pp. 86, 135–6), Böhm-Bawerk (1959, p. 380) and Wicksell (1934, p. 97).

Although the conception of long-period normal price is to all intents and purposes identical to Classical natural prices (or prices of production) and is enforced by the same mechanism of competitive mobility, some other, rather different price concepts were introduced. In particular, Marshall

argued that short-period prices might be objects of analysis, at least at the partial-equilibrium level. The short-period price is thus quite different from the Classical category of market price, the latter being a descriptive rather than an analytical category. The short-period position is characterised by a number of 'auxiliary constraints' (Samuelson, 1967, pp. 36–9), such as the structure of fixed capacity, or location of the labour force, which limit the full impact of competitive mobility. The short-period 'equilibrium' determined by the addition of these auxiliary constraints to the normal data of neoclassical theory must in some sense be a central point with respect to actual prices which will be affected by all those transitory elements not included in the catalogue of auxiliary constraints. But the short-period positions are, in turn, related to their centres of gravity, the long-period positions. Thus, within the period in which the basic circumstances of the economy are broadly unchanged, the short-period positions are not centres of gravitation, *but are positions from which the economy will tend to move.* The very conception of the 'short period' is arbitrary — some means of production move at one speed, some at another, some yet another. This might be a helpful starting-point for a specific, partial analysis, in which the *ceteris paribus* assumption holds other forces in their long-period configuration, but it is hardly the basis on which to erect a general theory of value. None the less, the short period will come to play an important part in the development of neoclassical theory, a topic to which we will return.

The proposition that prices are determined by supply and demand was common from the early days of economic debate. Ricardo, for example, had cause to complain that

> the opinion that the price of commodities depends solely on the proportion of supply to demand, or demand to supply, has become almost an axiom in political economy, and has been the source of much error in the science (Ricardo, 1951, p. 382).

Typically, supporters of the 'supply and demand position' attempted to generalise from the *law* of supply and demand

— that competition will tend to establish natural prices — to an explanation of the levels of natural prices themselves. They had no theory as such of the levels of prices, and resorted simply to asserting that prices were equal to the sum of wages, profits and rents, an empty truism. It was just these facile propositions that Marx dismissed as 'vulgar' (Marx, 1976, p. 146n).

The task of replacing 'vulgar' truisms with a *theory* of supply and demand presented a fundamental theoretical difficulty. In his notes on Senior's *Political Economy*, John Stuart Mill specified the problem clearly:

> It seems to me necessarily, when we mean to speak of the *ratio* between the demand for a commodity and the supply of it, that the two quantities should be, in the mathematical sense, homogeneous — that both of them should be estimated in numbers of the same unit (Mill, 1945, p. 143).

Senior, and others, failed to provide a unified treatment of supply (or cost) to balance against a 'utility'-based portrayal of demand (as presented, for example, by Say, quoted in Walras, 1954, p. 202). Costs were a heterogeneous amalgam of real wages, rents and profits which were related by Senior to primary abstinence alone (Senior, quoted in Cannan, 1929, p. 196). The requisite homogeneity was achieved by Jevons, Menger and Walras by deriving individual offers and demands from the balance of utility and disutility at the margin of constrained choice. All costs might be reduced to disutility. Over-all demand and offer functions (and the consequential supply functions in production models) are found by simply summing individual functions (see, for example, Walras, 1954, p. 94, Debreu, 1959, ch. 5). The equilibrium price of a good (or prices — the equilibrium is typically not unique) is then that which establishes consistency between over-all demands and over-all offers.

The data of the neoclassical theory are thus the information necessary to establish the model of price formation as the outcome of the competitive resolution of individual utility maximisation subject to the constraints of technology and

endowment, namely (see Debreu, 1959, pp. 75, 79):

(a) preferences (utility functions),
(b) technology,
(c) size of endowments, and
(d) distribution of endowments.

With suitable assumptions on the form of preferences and of technology a solution may be shown to exist.[8] But even given these assumptions, the analysis is not unproblematic, for it is also assumed that each agent acts independently of all others, that all are price-takers. This assumption allows us to derive the characteristics of economy-wide demand functions (or, more generally, excess-demand correspondences) from the assumed characteristics of individual agents (preferences, endowments).

If the assumption of price-taking behaviour is dropped, the demand functions must be replaced by reaction functions as individual agents determine their actions in the light of the actions of others. Many attempts have been made to construct general-equilibrium models in which price-taking is not assumed, beginning with the work of Negishi (1961), but it has recently been shown by Roberts and Sonnenschein (1977) that all these models rest on mathematical assumptions which have no economic rationale:[9]

> Despite these important contributions, the problem of such mixed Cournot—Chamberlin—Walras equilibria is not yet adequately resolved, since each of the above mentioned theorems employs assumptions made directly on the constructs to be used in the proofs, and the properties thus assumed are not derived from hypotheses on the fundamental data of preferences, endowments and technology. This is, of course, in sharp contrast with the theorems for the purely competitive case, in which, for example, all the properties of the excess-demand correspondence used in the proofs are derived from conditions on the individual agents' characteristics . . . the properties of reaction curves used in the existing theories of imperfectly competitive equilibrium have not been derived from the technological

conditions and the behavior these theories claim to address (Roberts and Sonnenschein, 1977, pp. 101, 104).[10]

Thus the assumption of price-taking behaviour is required in the construction of the neoclassical theory of value. But the bare assumption would appear unreasonable if it were not related to some behavioural aspect of the market economy. The consequence has already been suggested in the discussion of Roberts and Sonnenschein — there is assumed to be *perfect* competition. The content of this assumption was investigated by Cournot and Edgeworth, both of whom argued that price-taking behaviour would rule in an economy composed of an infinite number of agents (the euphemism 'large economy' is popular today). In recent years game-theoretic investigations have validated the Cournot—Edgeworth argument. The basic result, expressed in terms of the limit theorem on the core of the competitive economy, is summarised by Aumann (1964, p. 39):

> The notion of *perfect competition* is fundamental in the treatment of economic equilibrium. The essential idea or notion is that the economy under consideration has a 'very large' number of participants, and that the influence of each individual participant is 'negligible' . . . the influence of an individual participant on the economy cannot be mathematically negligible, as long as there are only finitely many participants. Thus a mathematical model appropriate to the intuitive notion of perfect competition must contain infinitely many participants.

Aumann also demonstrates that each of the infinity of participants must be infinitesimally small.

Thus the conception of competition found in the works of, say, Walras, Wicksell, Marshall and the early Hicks (1932) is an amalgam of two distinct propositions. First, there is the characterisation of capitalist competition inherited from the Classical economists, in which mobility, information, etc., are the key elements. Second, there is the infinity of infinitesimally small agents which generates the price-taking behaviour required by neoclassical theory. Knight's well-known list of

the conditions for perfect competition is an excellent example of such an amalgam (1971, pp. 77–9). The two propositions derive from quite different sources. The first is part of the general conceptualisation of competitive capitalism in the traditional method and is independent of any theory of value. The second derives from the logical requirements of the neoclassical theory of value, a theory the very substance of which is the determination of prices by the market resolution of individual actions. The second is therefore a theory-generated concept. Hence the anonymity of the individual agent required by neoclassical theory is *not* synonymous with Marx's conception of a system operating 'independent of men's will', as Hahn has claimed (1973, p. 33). The universality of competition in advanced capitalism is associated by Marx with the process of the concentration of capital which intensifies accumulation and competition. The freedom achieved by capital as it attains higher forms is manifest in joint-stock companies and sophisticated financial management — the institutionalisation of mobility. As Clifton has argued (1977, p. 150):

it is interaction among firms within the corporate sector, not the neoclassical world of 'small firms', that best approximates the assumption of a uniform rate of profit in the general theory of price.

The development of competition in this sense is an integral part of the development of the capitalist mode of production. Capital is always searching out its highest reward at all stages of capitalist development. The fact that it is typically the modern corporation rather than the independent capitalist that pursues this search today does not at all imply a lessening of competition in the capitalist economy. Nor does the fact that the freedom of movement of such large units of capital severely restricts the operating space of small business imply a decline of competition historically. In contrast to the vision of neoclassical theory, free capital mobility is not synonymous with the ability of small firms to move freely throughout the economy; it is merely the freedom of capital, however organised, so to move. Whatever the isolated cases of monopoly that occur

at all stages of capitalist development and among all size classes of firms, it seems clear that the large firms which dominate the economic process as a whole cannot in general be so characterised, for that process is a highly competitive one.

Once again, these propositions have nothing whatever to do with any *theory*, Classical or neoclassical, of the determination of prices or of the rate of profit. They are thus in no way equivalent to the neoclassical assumption of a continuum of agents.

Despite the addition of the infinity of agents to the definition of competition, the object of economic analysis which both Classical and neoclassical economists attempted to analyse and explain was the same, at least as far as prices are concerned: that is, the normal prices and general rate of profit of the long-period method. Since in neoclassical theory prices and quantities are determined simultaneously, the attainment of the profit-maximising combination of outputs is part of the theory of the profit rate, in contrast to the surplus approach in which the theory of value and distribution is separable from the theory of output and the process by which the rate of profit is established. In neoclassical theory the attempts of individual agents to maximise profits is part of the behavioural content of the theory, but in so far as the theory is directed towards the determination of long-period positions this does not inhibit the sought-for congruence between theory and method.

However, the long-period method, which has been the common ground of economic debate for two hundred years, has in the last few decades been increasingly challenged, and, in the more rigorous versions of neoclassical theory, been superseded, by varieties of short-period equilibria which do not display a uniform rate of profit on the supply price of capital.

The idea that short-period positions are susceptible to general analysis was first to assume importance in the interwar period. Much analysis was at that time devoted to attempts to analyse systems in which prices, outputs and the price level are not those of the long-period position. A

significant part of this work was conducted by Swedish economists who, starting from Wicksell's concept of the disequilibrium 'cumulative process' (Wicksell, 1935, pp. 190–208), constructed a theory whereby the cumulative process was woven into a dynamic theory of prices *and* outputs. The essence of Wicksell's cumulative process was the variation in the general price level due to a difference between the money rate of interest and the natural rate of interest – the latter being the real rate of return on capital associated with full employment of labour and capital in long-period equilibrium. This 'short-period' analysis led inexorably to a general analysis of equilibrium over time, in which expectations of future prices played a dominant role (see Lindahl, 1939, parts 1 and 2). For

> short-period general equilibrium cannot be determined independently of the changes it will undergo over time . . . [This was taken into account] in either of two ways: by introducing price expectations in the short-period equilibria, as was done by Hicks for his 'temporary equilibria' in *Value and Capital*, or, alternatively, by expanding the analysis into a theory of general intertemporal equilibrium based on the hypothesis of complete futures markets (Garegnani, 1976, pp. 37–8).

The decisive innovation was made by Hayek (1928) and Lindahl (1929), who divorced the short period from any relationship with the long period with respect to which it had been expressed, and defined an intertemporal equilibrium as market-clearing equilibrium in a temporal sequence of markets (see Milgate, 1979). The conceptual framework of intertemporal equilibrium is now familiar through the works of Malinvaud, Arrow and Debreu (Arrow and Debreu, 1954; Debreu, 1951, 1959, Malinvaud, 1953, 1961). The salient features are the specification of commodities by their location in time as well as by their qualitative characteristics, and the definition of equilibrium as the set of market-clearing prices determined either simultaneously or sequentially in markets from time 1 to time *T*. Whatever form the analysis takes, whether the temporary equilibria of Hicks (1946) or the full

equilibrium of Debreu (1959), there will not in general be a uniform rate of return on the value of capital in all sectors in each elementary time period. This aspect of the intertemporal method has been regarded by one writer as a notable virtue of the system, and an indication of its 'generality' (Bliss, 1975).

Since the pioneering work of Wald on the existence of competitive equilibrium it has been recognised that a *necessary* condition for the existence of competitive equilibrium in neoclassical general-equilibrium models is that the price of any producible commodity may, in equilibrium, be equal to, *or less than*, its cost of production, and that in general there will be some producible commodities for which the inequality will hold. With respect to producible means of production, capital goods, the presence of the inequality means that the rate of return will not be uniform on all capital goods. This would occur, for example, when the stock of a capital good being large relative to demand, the market-clearing price for that good is less than its reproduction cost — a typical short-run scenario. If the constraint that all producible means of production should yield a uniform return in each elementary time period were imposed on Debreu's (1959) model of inter-temporal equilibrium, the model would not solve, it would be overdetermined (Hahn, 1975). The overdetermination could be avoided by relaxing the condition that the endowment of producible means of production be expressed as a vector, and instead following Wicksell's (1934) lead by expressing the endowment of capital as a single amount of value — but the logical deficiencies of this approach are now well known (Symposium, 1966, Garegnani, 1970). Thus it may be argued, as Garegnani (1976) has done, that the abandonment by neo-classical theorists of the analysis of long-period positions, and their concentration on short-period positions, was a consequence of their inability to present a logically consistent analysis of the determination of the general rate of profit.

How are these short-period positions to be interpreted? Their short-period character derives from the necessity of specifying the stock of producible means of production as a vector, with the result that the capital stock will not in general be appropriate to the structure of demand. Of course,

if the model is one in which perfect foresight is assumed, and a sufficiently large number of time periods are taken into account, then 'eventually' the capital stock will be adjusted. But the equilibrium is not defined simply by 'later' time periods but by the market-clearing price vector in $n \times T$ dimensional space, i.e. for all commodities at all times.

Since the theory requires profit maximisation as a basic behavioural postulate, the short period is a position from which, given the possibility of mobility, the economy would tend to move away. Any transitory or specific event will *not* merely induce temporary deviation from a position towards which the system will tend to return, or around which it will tend to oscillate; instead transitory events will establish new short-period sequences. Since the equilibrium cannot be a centre of gravitation, any analysis of specific or transitory events must be treated *within* the specification of an 'equilibrium', rather than as factors causing deviation from a central position – hence the proliferation of general-equilibrium models which incorporate just those elements (inflexibilities, lack of information, or similar imperfections) previously dealt with as disturbances of greater or lesser import.

But leaving imperfections aside, the short-period equilibrium cannot be, on the behavioural assumptions by which it has been itself determined, a centre of gravitation.[11] And yet Debreu's equilibrium, and even Hicks's temporary equilibrium, are defined as 'competitive'. Clearly, the specification of what is meant by 'competition' has been changed from that which underlay the characterisation of natural prices or long-run equilibria. Means of production *are* assumed to be mobile between alternative uses, and yet there is not a uniform rate of profit. The notion of mobility has become a hybridisation of long-run mobility for non-reproducible means of production, and a fixed composition, short-run capital stock (Garegnani, 1960, p. 116). The fact, so clearly argued by Ricardo and by Marx, that changes in the structure of production, and hence the mobility of land and labour between alternative uses, are brought about by flows of capital, by changing the machines with which labour works and land is tilled, is either forgotten or ignored.

But while the definition of mobility is confused, the role of price-taking behaviour is to the fore. Indeed, it might be said that the issue of mobility has been virtually purged from the amalgam constructed by Walras, Marshall and Wicksell, and only the infinity of agents remains as the essential characteristic of a competitive economy. The forces which underlay the characterisation of the long-period method independently of any theory have been replaced by price-taking behaviour, a concept generated by a specific theory. The issue of mobility in a capitalist economy has been obscured and distorted. The resulting conception of equilibrium is an intellectual mutant, serving only the interest of a particular theory, and quite divorced from the phenomena that that theory purports to explain — the persistent behaviour of a capitalist market economy. The duality of the centre of gravitation enforced by competition and the centre of gravitation implicit in theoretical abstraction is now lost; and in consequence the system has become analytically incoherent. The price magnitudes determined in the solution of neo-classical general-equilibrium models should be centres of gravitation. Instead, they define points from which the economy would always tend away. Since the old definition of competition would expose this deficiency, the meaning of the term 'competitive' has been redefined in terms of price-taking behaviour to make it consistent with changed method. So a theory-generated concept, perfect competition, is allied with a theory-determined object — a question chosen to fit the theory.

The argument of this essay has been intended to show that something has gone badly wrong with economic analysis. The careful specification, and separation, of method and theory developed by Smith, and essentially preserved by the early neoclassics, has been abandoned in the interest of the preservation of a theory which proved inadequate for the task it was originally set. This suggests a need for a reappraisal of the notion of competition and its role in economic theory. In particular, since the surplus approach has now been shown, by Sraffa and others, to be immune from the logical ills which were previously believed to afflict it, a return to that system would appear to be imperative. In the surplus approach

the difficulties, and peculiarities, encountered by neoclassical economists do not arise, and in consequence it provides a much firmer foundation for all aspects of economic theory, and not only for the theory of value.

NOTES TO CHAPTER 6

1. The term 'long-period positions' refers both to the Classical conception of positions of the economy associated with natural prices or prices of production and to neoclassical long-run equilibria. The relationship of these two conceptions will be discussed below.
2. The same problem of the relationship between method and theory arises in the analysis of output. In neoclassical theory, where the theory of value *is* the theory of output, the issues are likewise identical. In Classical analysis, and more importantly in the interpretation of the Keynesian theory of output, the relationship between theory and method poses a number of difficult questions (see Garegnani, 1978, 1979). Unfortunately, these cannot be dealt with in the space of this essay, which is focused on theories of value and distribution alone.
3. The argument of this essay will be concentrated on the relationship between different characterisations of competition and the formation of a general rate of profit. Competition plays another, related role, the enforcement of minimum-cost production. The link between competition and 'efficiency', defined in this sense, is common to all systems of analysis. It is certainly not a peculiarity of neoclassical theory, in which 'efficiency' is defined in a manner which includes minimum-cost production, but also refers to the allocation and utilisation of total resources.
4. Smith remarked, 'I have no great faith in political arithmetic' (1961, p. 501).
5. Ricardo would demonstrate that Smith's characterisation of natural price as the sum of wages, profits and rents was incorrect. Natural prices are determined by the conditions of production on the least favourable 'socially necessary' land which pays no rent. None the less, associated with a set of natural prices and a rate of profit there will be a set of appropriate rents (see Sraffa, 1960, ch. 11).
6. McNulty (1967) and Hayek (1948) draw a distinction 'between competition as a market structure and competition as behavioural activity. It is that distinction which must be made between the concept of perfect competition developed by nineteenth- and twentieth-century theorists and the concept of competition earlier employed by Adam Smith and his predecessors' (McNulty, 1967,

p. 399). The investigation of the characteristics of the position which is the outcome of a competitive process is portrayed as 'the tautological method which is appropriate and indispensable for the analysis of individual action [which] seems in this instance to have been illegitimately extended to problems in which we have to deal with a social process' (Hayek, 1943, p. 93). This argument has missed the point that the social process of competition plays the vital organising role of characterising the social object of analysis. As we shall see below, McNulty and Hayek have some justification in separating the process of competition from the specification of perfect competition; but they then fail to relate that process to anything. In particular, they fail to identify its vital role in the analysis of value and distribution.

7. The 'long run' thus refers less to a period of time than to a method of analysis. In dealing with historical changes of population, of technology or of tastes, Marshall uses the term 'secular' (1920, p. 315).

8. The separation of the question of existence from that of stability of equilibrium has become a necessary part of neoclassical general-equilibrium theory since the realisation that, in general, no equilibrium could be demonstrated to be stable. The relationship between stability analysis and the argument of this paper is discussed below, note 11. Hahn has argued that 'the view that an equilibrium notion is only useful to economists insofar as it involves the falsifiable claim that all actual economic process converges to *an* equilibrium state' is not correct (1973, p. 9). His argument rests on the role of equilibrium as a solution to a given system, as an organising concept by means of which to characterise a solution. Hahn is making two mistakes. First, he has failed to notice that *any* abstraction embodies the implicit assumption of gravitation. Second, he is locating the problem of gravitation in the context of the theory alone, ignoring the method. On this latter characteristic of neoclassical general-equilibrium theorists, more will be said below.

9. The crucial *ad hoc* assumption is that the optimal choices by each firm should define a convex-valued correspondence. Roberts and Sonnenschein comment that even in the context of relatively simple models 'any conditions sufficient to guarantee the convex-valued reaction curves needed to apply Kakutani's theorem would appear to be very restrictive. If we attempt to enrich the model by introducing costly production, multi-product firms, several firms producing a given commodity, etc., one must suspect that any conditions sufficient for existence which would be obtained would be so restrictive as to leave the theorems essentially without interest' (1977, pp. 110–11).

10. See also Arrow and Hahn (1971, p. 166).
11. It should be made clear that this proposition is quite different from that confronted by orthodox stability analysis. Even if the functions determining the equilibrium were such as to display mathematical stability (commodities were gross substitutes), the equilibrium would not be a centre of gravitation since those functions are based on data – notably arbitrary stocks of capital goods – which profit-maximising behaviour would tend to change. The issue of stability in neoclassical analysis is not as easy to disentangle from existence as many of its practitioners have implied. Since the determination of prices depends on functional relationships between prices and quantities, the interactions between prices and quantities are an essential part of the economic rationale of the theory. In Classical theory, on the other hand, the determination of prices and the determination of outputs are *separable*. Thus the variation in outputs which accompanies the gravitation of market prices to natural prices involves a gravitation towards given quantities, the effectual demands, given, that is, by forces which are separable from those which determine natural prices (see Garegnani, 1976, p. 29).

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CHAPTER SEVEN

Piero Sraffa's 'Production of Commodities by Means of Commodities' and the Rehabilitation of Classical and Marxian Political Economy

Ian Bradley and Michael Howard

1 INTRODUCTION

Sraffa's book (1960) is distinctly peculiar. It is sub-titled a 'prelude to a critique of economic theory', though no economist later than Marshall is cited and few hints as to what this critique consists of are given. Furthermore, there is no explicit suggestion that the framework in which the analysis is presented might have a positive role in any reformulation. The assumptions on which the conclusions rest are not systematically presented but are scattered throughout the text and appendices. Moreover, these assumptions do not contain a statement of the institutional structures to which the analysis relates. There is, for example, no assumption pertaining to economic agents. In particular, there is no specification that producers maximise profit, that consumers choose rationally and there is no reference to demand or supply relations. Conclusions are frequently drawn from a reasoning which is not only terse, but *in itself* inadequate, when judged by the

standards of proof generally demanded by economic theorists. The mathematical exposition is often expressed in terms now no longer used, even though the preface acknowledges the author's indebtedness to a number of distinguished mathematicians, and Sraffa has expressed the view that economic theory can be, and should be, constructed with absolute precision.[1]

It is, however, the case that rigorous proofs can be provided for many of the propositions stated by Sraffa.[2] Furthermore, these propositions may be shown to undermine conclusively the basis of much economic analysis. The neoclassical theory of capital productivity founded by Clark (1899), developed by Hicks (1932), Solow (1956) and Samuelson (1962), and which has been embraced by countless other less notable economists, is threatened. So, too, is Austrian capital theory, originated by Menger (1871) and Böhm-Bawerk (1888), and extended by Wicksell (1901), Hayek (1941) and Hicks (1973). It has also been maintained by several theorists[3] that Sraffa's analysis reveals critical defects in the general-equilibrium approach emanating from Walras (1874) and formalised by Debreu (1959).

Moreover, since the framework of Sraffa's work mirrors that of Classical and Marxian political economy, it has been claimed as a 'magnificent rehabilitation' of this type of economics (Meek, 1967, p. 101).[4] In this essay we present an exposition of Sraffa's analysis and attempt to assess some weaknesses of any economics founded upon it. As such we do not call into question Sraffa's place in the Classical tradition of economic theory, but instead attempt to indicate certain limitations of this tradition as they are exemplified in Sraffa's work.

2   THE PROBLEMS CONSIDERED BY SRAFFA

Sraffa's concern is to examine the relationships which exist between technology, relative prices, the rate of profit and the wage within particular types of economic systems which are defined by the assumptions in section 3. In every such system the wage and relative prices are determined at economically

meaningful levels by technology, once the rate of profit is set at a specific viable level. Changing the magnitude of this variable is associated with changes in relative prices and the wage, so the general forms which these relationships take can be examined. A related problem which is also examined is the comparison of different economic systems with particular reference to how the system which maximises the wage alters as the rate of profit is set at different levels.

3   THE ASSUMPTIONS OF SRAFFA'S ANALYSIS

The types of economic system considered are specified by Sraffa's assumptions. These relate to the form of technology, relative prices, the wage and the rate of profit.

(i) PRODUCTIVE PROCESS

Each of the economic systems considered is represented technologically by a set of productive processes which transforms input vectors into output vectors. Any particular production process within a system is distinguished from the others by the proportions in which it utilises and produces the various commodities.

(ii) PERIODS OF PRODUCTION

Each process of production in every system has the same period of production between the application of inputs and the realisation of outputs. In Sraffa's words, there is an 'annual cycle of production'.

(iii) SELF-REPLACEMENT

Each system is capable of being brought into a 'self-replacing state' with regard to produced commodities. Produced commodities are commodities which can be technologically produced as *new* goods without loss at the prevailing prices, wage and rate of profit.[5] The system would be in a state of self-replacement if the aggregate of any produced commodity

used as input was not greater than its aggregate output. Sraffa's assumption is not that the systems considered are actually in a state of self-replacement but only that every system considered is capable of being brought to such a state by changing the proportions in which the individual processes enter it (1960, pp. 4–5, 11).

(iv) UNIFORMITY OF WAGES, PRICES AND PROFITS

In every system each unit of labour receives the same wage, reflecting the supposition that labour is 'uniform in quality or, what amounts to the same thing, we assume any differences in quality to have been previously reduced to equivalent differences in quantity' (Sraffa, 1960, p. 10). In addition, the price structure of every system is such that the price of a commodity is the same irrespective of whether it is an input or output and the price of each produced commodity is equal to its cost of production (Sraffa, 1960, p. 91).

In systems which involve profits it is assumed that the rate of profit is the same in each process, and profits, determined by this uniform rate, are considered part of the costs of production (Sraffa, 1960, p. 6).[6]

(v) PAYMENT OF WAGES

In most economic systems which involve a surplus of produced commodities over replacements it is assumed that the wage is paid 'post factum' at the end of the production period and not advanced at the beginning (Sraffa, 1960, p. 10).

(vi) DETERMINATION

Each economic system is assumed to be comprised of data and relations which ensure that, given the rate of profit, the wage and relative commodity prices are determined uniquely and are economically meaningful. Sraffa explicitly expresses this assumption by stating that, in each system, the number of distinct processes[7] is equal to the number of commodities, both produced and non-produced (1960, pp. 5, 7, 44, 63, 77, 78). However, he recognises that this is not in general an ade-

quate representation of his assumption concerning determination.[8]

(vii) BASIC COMMODITIES EXIST

The commodities comprising any system are divided into two types, basic and non-basic. This distinction is important with regard to understanding the determination of relative prices and the wage given a rate of profit. Sraffa formulates the distinction between basic and non-basic commodities as follows (1960, pp. 51–2):

> In a system of k productive processes and k commodities ... We say that a commodity or more generally a group of n linked commodities (where n must be smaller than k and may be equal to 1) are *non-basic* if of the k rows (formed by the $2n$ quantities in which they appear in each process) not more than n rows are independent, the others being linear combinations of these. All commodities which do not satisfy this condition are *basic*.[9]

Sraffa provides no intuitive economic interpretation of the nature of basics in the general case.[10] However, in the case of a system composed only of produced commodities, where each is produced by only one process, basic commodities may be classified as those which enter, directly or indirectly, as means of production into all commodities (Sraffa, 1960, pp. 7–8).

Sraffa assumes that every economic system includes at least one basic (1960, pp. 8, 50). Each system, therefore, involves a 'whirlpool' production structure where it is impossible, even in the case where each good is produced by only one process, to arrange the commodities in a hierarchy, as in Austrian theory.

(viii) LABOUR INPUTS

Sraffa does not explicitly state that labour is involved as an input in all production processes of every system. Nevertheless, it seems implicit that this assumption is made, so there

are no completely automated production processes involving no direct labour.

(ix) RETURNS TO SCALE

The analysis is 'concerned exclusively with such properties of an economic system as do not depend on changes in the scale of production' (Sraffa, 1960, p. v). Consequently there is no assumption concerning returns to scale or specification of demand and supply relations. Instead, the analysis assumes predetermined levels of inputs and outputs.

4   THE SYSTEMS CONSIDERED BY SRAFFA

The most general type of system defined by the above assumptions can include joint production as well as single-product processes, fixed as well as circulating capital, and the utilisation of non-produced as well as produced commodities. Such a system can be written as:

$$A\mathrm{p}(1 + r) + D\mathrm{s} + \mathrm{f}w = B\mathrm{p} \qquad (7.1)$$

where A is an $m \times n$ input matrix of produced means of production, D is an $m \times q$ matrix of non-produced means of production, B is an $m \times n$ output matrix, p is an n-element column vector of relative prices relating to produced goods, s is a q-element column vector of relative prices relating to non-produced goods, f is an m-element column vector of labour inputs, r is the rate of profit and w the wage. By assumption (vi) $m = n + q$, and once r is set at a viable level with a *numéraire* specified, p, s and w are determined uniquely and at economically meaningful levels.

Sraffa builds up to the conceptualisation and analysis of such a complex system by considering various simpler systems which are specialisations of it and also by concentrating analysis on particular segments of such systems. The simplest system considered is a subsistence and, therefore, zero-profit economy, where all commodities are produced and there is no joint production or any form of fixed capital. Such a

system can be represented by the matrix equation:

$$A\mathbf{p} = \mathbf{p} \tag{7.2}$$

The second form of system considered is exactly the same as this except that a surplus exists which is distributed according to the equal-profitability assumption. It can therefore be represented by the matrix equation:

$$A\mathbf{p}(1 + r) = \mathbf{p} \tag{7.3}$$

In both these cases wages are regarded as consisting only of what is necessary for subsistence and enter the systems as commodity inputs 'on the same footing as the fuel for the engines or feed for the cattle' (Sraffa, 1960, p. 9); consequently labour inputs do not appear explicitly. In the second case wages are therefore considered as advanced from capital.

The third form is the same as the second except for a re-conceptualisation of wages as paid out of surplus, *ex post*, so that the input matrix now incorporates only non-labour inputs, and profit is distributed in proportion to the value of these inputs alone. Such a system can be represented by the matrix equation:

$$A\mathbf{p}(1 + r) + \mathbf{f}w = \mathbf{p} \tag{7.4}$$

The fourth form introduces fixed capital and this is accomplished by considering such durable goods in terms of a joint-production framework. These goods at different stages of obsolescence are treated as different goods, and older goods, remaining at the end of the production period, as by-products. Consequently every such capital good lasts for only one period. This is the appropriate procedure in a general theory of capital.[11] The matrix equation representing such a system can be written as:

$$A\mathbf{p}(1 + r) + \mathbf{f}w = B\mathbf{p} \tag{7.5}$$

The fifth form introduces pure joint production, i.e. joint products other than those which arise from the use of fixed capital. Formally it can also be represented by equation (7.5).

Sraffa also considers the production processes involving non-produced inputs which may form a sub-set of processes in any of the above types of system.

5   RECONSTRUCTING A SYSTEM

Sraffa explores the relationships which can be shown to exist between technology, relative prices, the wage and rate of profit in all these types of economic system. In addition, his analysis involves a comparison of different types of economic system with special reference to the problem of how the set of processes which maximise the wage for any viable pre-determined rate of profit changes as the rate of profit changes. In generating his results Sraffa utilises various devices which restructure the economic systems under examination so as to reveal their properties more clearly. In the following three sub-sections we outline the nature of these restructuring devices.

REDUCTION TO DATED LABOUR

In any system where direct labour inputs are explicitly stated and where there are no non-produced material inputs, 'reduction to dated labour' consists of resolving the price of a commodity into the series of direct and indirect embodied labour inputs. Each such dated labour input is multiplied by the wage and the profit factor $(1 + r)$ to a power indicating the number of periods which have occurred between the utilisaton of that labour and the emergence of the final product. Each term is thereby weighted by an appropriate magnitude indicating its date.

Take the most general form of a system to which the operation is relevant. This is represented by the matrix equation (7.5)

$$A\mathbf{p}(1 + r) + \mathbf{f}w = B\mathbf{p}$$

The problem is to represent the price vector p in terms of a series of vectors each composed of appropriately dated labour

quantities. Define d^0 as the column vector of direct labour inputs involved in the production of a unit of each commodity, such that $f = Bd^0$, so $d^0 = B^{-1}f$. This represents the vector of unit direct labour requirements, and is therefore the labour vector of date 0.

Define f^1 as the vector of direct labour requirements necessary, together with a matrix of non-labour inputs A^1, to produce A (which, in turn, together with f, produces B). f^1 is therefore the first-stage indirect labour requirements needed to produce B. Also define d^1 as the corresponding first-stage indirect labour requirements to produce one unit of each commodity as final output, such that $f^1 = Bd^1$, so $d^1 = B^{-1}f^1$. Since $f^1 = Ad^0$, $d^1 = B^{-1}AB^{-1}f$. This represents the vector of first-stage indirect unit labour requirements and is therefore the labour vector of date 1.

Defining d^2 as the second-stage indirect unit labour requirements and carrying out a procedure analogous to the above we would find that $d^2 = (B^{-1}A)^2 B^{-1}f$. This would represent the labour vector of date 2. This procedure may be repeated for d^3, d^4, and so on. Such terms are components of the matrix reduction series which represents the price vector p:

$$B^{-1}fw + (1 + r)B^{-1}AB^{-1}fw + (1 + r)^2(B^{-1}A)^2B^{-1}fw + \ldots$$

$$(7.6)$$

Hence we have a series of dated labour vectors each of which is multiplied by the relevantly powered profit factor and the wage. Given a 'whirlpool' production structure, such a series is necessarily infinite, and with only a finite number of terms represented there should also appear a commodity residue matrix multiplied by the price vector and weighted by a profit factor.

It may not be possible to compute the series. The inverse matrix B^{-1} will not exist if the output vectors of the production processes do not form a linearly independent set. Furthermore, the series may not be economically meaningful. Some of the dated labour terms may be negative, as B^{-1} need not be a non-negative matrix. Nor does the series necessarily converge. $(B^{-1}A)^t$ need not tend to zero as t tends to infinity.

However, in the case where each commodity is produced by only one process B becomes a diagonal matrix which, by a suitable choice of units, can be represented by the identity matrix I, and in this case equation (7.6 becomes:

$$\text{f}w + (1 + r)A\,\text{f}w + (1 + r)^2 A^2\,\text{f}w + \ldots \qquad (7.7)$$

Here, given Sraffa's assumptions, the terms can be computed; they are all positive and the series converges for $0 \leqslant r <$ maximum r.

This operation of 'reduction to dated labour' is useful for a whole range of analytical issues. For example, it is of central importance in the evaluation of Austrian theory. A hallmark of this approach is the representation of production processes in terms of a series of dated labour ('original factor') inputs. However, while Austrians utilise this formulation they have not fully enquired into the conditions which ensure it to be a valid one. Sraffa's analysis is directly relevant to this issue. In the case where each commodity is produced by a single process Sraffa shows that the reduction can be accomplished. In doing so he provides some support for the legitimacy of the Austrian conception of production as a 'one way avenue that leads from "factors of production" to "consumption goods"' (Sraffa, 1960, p. 93). But the analysis also undermines the generality of this conception; it is not always applicable to cases of joint production. And without representation in terms of dated 'original factors' none of the Austrian superstructure can stand. There is no possibility of measuring 'roundaboutness' and no possibility of associating roundaboutness with accumulation, distribution and the rate of profit.

SUB-SYSTEMS

While the dated labour analysis has been applied to the price vector p, in the cases where the series exists and converges the sum of the dated labour vectors would represent the vector of total labour values. However, to compute this vector, Sraffa typically uses another restructuring device called a sub-system.

A sub-system is defined as a restructuring of an economic system such that the system is transformed into one which is in a self-replacing state and in which only one unit of a particular commodity appears in net output (Sraffa, 1960, p. 89). Thus, for example, given a system whose produced input matrix is A and whose output matrix is B, we seek a row vector of multipliers, s, such that $sB - sA = e$, so that $s = e(B - A)^{-1}$, where e is a unit row vector. The multipliers are then used on the actual system to convert it into the sub-system.

As with 'reduction to dated labour' this device has many possible analytical uses. We have already mentioned that it is one way of computing labour values. Although the aggregate of labour involved in a sub-system produces not only the commodity appearing in net output, nevertheless, since all the other commodities produced are replacements, this labour can be regarded as being 'embodied' in the commodity: 'Thus in a sub-system we see at a glance, as an aggregate, the same quantity of labour that we obtain as a sum of a series of terms' in the reduction equation (Sraffa, 1960 p. 89). Moreover, it indicates that labour values may not be well-defined economic categories. Sub-systems may not be capable of being derived, for the matrix $(B - A)^{-1}$ may be singular. In the case of joint production some elements of s will be negative, which may imply negative labour values. Naturally this has profound consequences for *any* labour theory of value. The sub-systems device also allows a simple demonstration of reswitching and capital reversal which undermines the neoclassical theory of capital productivity (see, for example, Garegnani, 1970).

THE BASIC SYSTEM AND THE STANDARD COMMODITY[12]

In the previous section we have dealt with the distinction between basic and non-basic commodities. The importance of this distinction is that the former can be shown to play a far more fundamental role than the latter. Sraffa argues that we can entirely eliminate non-basics from a system and preserve certain relationships unchanged.

Assuming we have a system comprising k processes and k commodities:

> we can find a set of multipliers . . . which applied to the original k equations make it possible to combine these into a smaller number of equations (equal in number to the basic products) in each of which any quantity of a non-basic is cancelled by an equal quantity of opposite sign, so that only basics are included in quantities different from zero (Sraffa, 1960, p. 52).

In other words, Sraffa demonstrates that it is possible to find a set of elementary row operations applied to A and B which will yield matrices A^* and B^* such that the elements in the columns associated with non-basics will all be zero.

The resulting set of equations is called the basic system (Sraffa, 1960, pp. 52, 92).[13] This system is equivalent to the original in that the values which it determines for the prices of basics and the wage, given the rate of profit, will also be solutions for the original system (Sraffa, 1960, pp. 55, 62). However, such a system may not be a feasible arrangement of actual production processes because a basic equation may not represent an actual process and it may contain negative as well as positive quantities (Sraffa, 1960, pp. 52–3). However, if the non-basics are all produced commodities and there is no joint production these difficulties do not occur (Sraffa, 1960, p. 52). And, in any event, given the determining role of basics, it is possible for many purposes to concentrate attention on the simpler basic systems.

This analysis can be utilised in a variety of ways. For example, it indicates that Ricardo's propositions concerning the determining role of wage goods, on which he based his proposals for taxation reform, were well founded. More importantly it shows that, in general, the rate of profit will not be functionally related to the size of the aggregate capital stock, as Smith, Malthus and neoclassical productivity theorists have argued. The capital stock includes non-basics and, therefore, elements irrelevant to the determination of the rate of profit.

The basic system can be used to reconstruct the economic

system into proportions which highlight the relation between the wage and rate of profit. To derive this, we seek a vector, q, of multipliers which, when applied to the basic system, alter the proportions of these equations, so that the aggregate output of each basic bears the same proportion to its use in aggregate as an input. Defining $1 + R$ as the common ratio of aggregate output to aggregate input for all the various commodities (thus R is the common ratio for all commodities of *net* output to aggregate input) we seek the vector q such that:

$$A^*q(1 + R) = B^*q \qquad (7.8)$$

The matrix equation (7.8) gives an equation for R of the same degree as the number of basics, so there may be multiple values of R, to each of which corresponds a set of multipliers.[14] However, only the lowest R and its set of multipliers turn out to be useful for Sraffa's purpose, which is to use the net product of such a reconstructed system as *numéraire* in the study of the actual systems.

The smallest R is termed, by Sraffa (1960, p. 21), the 'standard ratio'. The net product is called the 'standard net product' or 'standard national income' or 'standard (composite) commodity' (1960, p. 20). The set of equations taken in the proportions which produce the standard commodity is called the 'standard system' (1960, p. 20). Sraffa takes as *numéraire* that amount of the standard commodity which would form the net product of the standard system, employing the whole annual labour of the actual system to which it relates (1960, p. 20). The annual labour of all actual systems is assumed to equal unity (1960, p. 10). Consequently, with profits and the wage of the standard system measured in this *numéraire*, we have:

Profit = 1 − Wage

Since in Sraffa's units net product is 1, the total quantity of commodities used up in production in the standard system is

$1/R$ units, and division by this yields:

$$r = R(1 - w) \qquad\qquad (7.9)$$

This shows that the rate of profit in the standard system is a decreasing linear function of the wage and is independent of prices.

The importance of this relation, and of the construction from which it is derived, is that Sraffa shows that it applies to the actual system from which the standard system is derived when the standard commodity is used as *numéraire*: 'The same rate of profits, which in the standard system is obtained as a ratio between *quantities* of commodities, will in the actual system result from the ratio of aggregate values' (1960, p. 23).[15] Furthermore, if equation (7.9) is added to the actual system, as a replacement for the equation defining the *numéraire*, then prices and wages are expressed in terms of the standard commodity (Sraffa, 1960, p. 31). It follows that R may be termed the 'maximum rate of profit' for the standard as well as the actual system (Sraffa, 1960, pp. 17, 22). It is associated with a zero wage, and as the wage, measured in the standard commodity, rises above zero, the rate of profit falls. Moreover, this relation is independent of the movement of prices.

In the absence of joint production and scarce non-produced commodities, all components of the standard commodity will be positive (Sraffa, 1960, p. 29). In the more complex cases negative components can occur (Sraffa, 1960, pp. 53, 72, 77). This, however, does not restrict the use of the standard commodity as a *numéraire*, for the choice of a *numéraire* is arbitrary in an economic system which does not involve money. In such a case the *numéraire* is only a unit of account. What is important is that the *numéraire* chosen has properties which aid analysis, and the standard commodity *numéraire* is so endowed because of the simple relationship it establishes through equation (7.9).[16]

The standard commodity construction has many other possible uses. For example, it shows that Ricardo was under no logical necessity to abandon the essential idea involved in his corn model because of the criticisms of Malthus.

6   SOME LIMITATIONS OF A SRAFFA-BASED
    POLITICAL ECONOMY

In the preface of his work Sraffa stated the following:

> It is . . . a peculiar feature of the set of propositions now
> published that, although they do not enter into any dis-
> cussion of the marginal theory of value and distribution,
> they have nevertheless been designed to serve as a basis for
> a critique of that theory. If the foundation holds, the
> critique may be attempted later, either by the writer or by
> someone younger and better equipped for the task (Sraffa,
> 1960, p. vi).

Despite the fact that certain errors have been shown to
exist in the analysis,[17] there can be no doubt that the
foundation has 'held' and provided a basis for an important
critique of certain forms of neoclassical theory. Furthermore,
since the structure of Sraffa's work is similar to that of the
'old classical economists' (Sraffa, 1960, p. v), there can also
be no doubt that it simultaneously provides a basis for the
rehabilitation of their approach to eonomic theory.

In this section we seek to highlight some limitations of this
form of economics as exemplified by Sraffa's work. To avoid
any misunderstandings which may occur we stress that our
argument has not been consciously designed as part of a neo-
classical counter-attack. The neoclassical theory of capital
productivity and Austrian capital theory have been conclu-
sively undermined by Sraffa's analysis, while Walrasian theory,
as formalised by Arrow and Debreu, is sufficiently robust to
take care of itself on any question of logic. Our purpose is
more innocent. It is simply to point out those limitations
which must occur in any economics founded on Sraffa's
assumptions.

From this standpoint the limitations of Sraffa's work
would seem to derive from assumptions (iv), (vi) and (vii) as
listed in section 3 above. The other assumptions are essentially
unproblematic. This is obvious with regard to assumption (i).
It is also the case, although less obviously so, with assumption

(ii). A production process that involves t periods can be decomposed into t sub-processes by introducing $t - 1$ intermediate input vectors and $t - 1$ intermediate output vectors. Each sub-process can then be taken to be a *separate* process with the same period of production. Every such multi-period production process can be treated analogously, and moreover the periods chosen so that each over-all process is an integer multiple of some 'unit period' (Sraffa's year). All such multi-period production processes can therefore be decomposed into a set of unit-period sub-processes and these taken to be the production processes of the system under consideration.[18]

Assumption (iii) is commonly referred to as the assumption of economic viability, and in the context of an analysis which also utilises assumption (iv) it is a perfectly sensible assumption to make. Assumption (v) is certainly less reasonable but it is not clear to what extent.[19] Furthermore, Sraffa's models can be easily reformulated assuming advance payment of wages. Assumption (viii) is actually redundant. Sraffa's results could be preserved without it, providing direct labour is involved in the production of at least one basic commodity. Finally, any discomfort with assumption (ix) can be alleviated by assuming instead that there are constant returns to scale (Sraffa, 1960, p. v).

We can therefore proceed to a discussion of Sraffa's assumptions concerning the uniformity principle, determination and basics.

THE UNIFORMITY PRINCIPLE

The uniformity principle is a quality of the equilibria considered in certain forms of neoclassical economics, particularly in productivity theory and Austrian theory. In neoclassical economics, however, both prices and distributional variables are considered to be endogenous. Consequently, the uniformity principle cannot form an *assumption* of this theory. Instead it must be a deduced property. This is easy to accomplish so far as wages and profits are concerned. Assuming competition, the absence of externalities, no uncertainty and maximising behaviour, then, in equilibrium, homogeneous units of labour receive the same wage, and rates of return in

all production activities, which involve the same time scale, must be equal. These assumptions do not, however, guarantee that the equilibrium price vector will be stationary. It is therefore not surprising that neoclassical economists have increasingly abandoned the uniformity principle as it applies to prices. Within this form of economics a stationary price vector only forms an inappropriate constraint upon the full generalisation of the theory.

In the Ricardo—Marx—Sraffa tradition matters are somewhat different. Here, a distributional variable, the wage or rate of profit, is considered exogenous. Consequently, it is methodologically legitimate to *assume* either that wages are uniform or that rates of profit are uniform. However, as with neoclassical theory, prices are considered to be endogenous variables. It follows that if equilibria are to be characterised by the uniformity principle, the uniformity of prices and one distributional variable must be deduced. However, neither Ricardo nor Marx provided the requisite analysis. Instead, both seemed to take it as self-evident that the uniformity principle would fully apply. Subsequent work in Classical and Marxian analysis has failed to fill this vacuum.

Sraffa, of course, was under no obligation to do so. The stated purpose of his work is purely critical. As such it is possible for him to use the uniformity principle as a genuine assumption. However, those economists who seek to go beyond this and 'build a twentieth century model to deal with twentieth century problems' (Meek, 1967, p. 161) within the Ricardo—Marx—Sraffa tradition cannot do so. They are duty bound to close their models by providing an economic rationale for the uniformity principle. So far this has not been done.

This is by no means a tangential issue. We can illustrate its significance through the use of a simple Sraffa model. Take, for example, the following system involving one circulating capital good (Commodity 1) and one consumption good (Commodity 2):

$$wf_1 p_2^2 + k_1 p_1^1 (1 + r) = p_1^2$$

$$wf_2 p_2^2 + k_2 p_1^1 (1 + r) = p_2^2$$

The superscripts on prices refer to time. Thus p_1^2 is the price of the capital good at the output date and p_1^1 is the price of the capital good at the date when inputs are applied. Assuming that the uniformity principle applies to prices and that the consumption good is taken as *numéraire*, the wage and prices are determined for any specified r. For example, if f_1, f_2, k_2 are all equal to unity and $k_1 = 1/5$, then, given $r = 1$, w is determined at $3/13$ and p_1 at $5/13$. But if prices are unconstrained to be uniform, then specifying r and the *numéraire* is not sufficient to determine either prices or the wage. Now, if r is set at unity, the parameters of the numerical example are consistent with $w = 5/13$, $p_1^1 = 4/13$ and $p_1^2 = 33/65$, as well as the previous solution and a host of other solutions.

Furthermore, without the assumptions of price uniformity other significant propositions of the Ricardo—Marx—Sraffa tradition no longer hold. This is true for those relating equilibrium prices to labour values, and those concerning the determining role of wage goods or basics, the construction of the standard commodity, the reduction to dated labour and the variation of systems of production with distributional changes.

It is therefore obvious that to preserve the vitality of this form of analysis some convincing rationale for the price uniformity property is required.

DETERMINATION

Neither Ricardo nor Marx specified the conditions that would ensure the existence of determinate and economically meaningful solutions. Sraffa follows in the same spirit and, apart from occasional hints as to the conditions required, assumes that the systems he discusses are appropriately determined. However, while this might form the basis of a reasonable complaint against Ricardo and Marx, it cannot do so in the case of Sraffa. His stated purpose is purely critical and in this context it is clearly legitimate to carry out analysis on such an assumption. Nevertheless, it is equally clear that any rehabilitation of Classical and Marxian political economy which seeks to progress beyond this cannot simply assume determinacy.

Naturally, this is a well-recognised problem, and analysis has been provided of the conditions ensuring determination in Sraffa-type models.[20] However, in doing so, certain dubious procedures have been adopted and problems have been encountered which have been dealt with in an unsatisfactory way. There are two such matters which we would wish to emphasise.

First, a determination problem occurs in a Sraffa system which involves non-basics. Take, for example, the simplest case of a system represented by the matrix equation

$$A\mathbf{p}(1 + r) + \mathbf{f}w = \mathbf{p}$$

Here, given Sraffa's assumptions, the rate of profit and a *numéraire*, it is only the production conditions of basics which are relevant to the determination of the wage and the prices of basics. The prices of non-basics are formed from these and from their own production conditions. Without further restrictions, however, non-basic prices may not be economically meaningful. If a non-basic requires itself as an input such that its output—input ratio is less than $(1 + r)$ then it will be impossible for all prices to be non-negative if they are constrained to be uniform. Sraffa himself notes this possibility as follows (1960, p. 91):

> It is perhaps as well to be reminded here that we are all the time concerned merely with the implications of a uniform price for all units of a commodity and a uniform rate of profits on all the means of production. In the case under consideration . . . [it will be impossible] . . . for these conditions to be fulfilled. The . . . [non-basic] . . . could however still be produced and marketed to show a normal profit if the producer sold . . . [it] . . . at a higher price than the one which, in his book-keeping, he attributes to . . . [it] . . . as means of production.

Nevertheless, Sraffa provides no argument which could be used to close such a system. Moreover, the problem further highlights the difficulty considered in the previous sub-section. If non-basic prices may depart from the uniformity principle, why is it appropriate to constrain basic prices by it?

In later writings Sraffa (1962a, 1962b) has returned to the

problem and maintained that 'low' self-reproduction rates of non-basics are empirically unlikely. This has been repeated by many others.[21] However, we are not told on what information this assertion is based. As a consequence it is difficult to resist the conclusion that such statements are of the same status as those adopted in the defence of Austrian capital theory and neoclassical productivity theory to the effect that reswitching and capital reversal are unlikely to actually occur. In any event these statements do not fit into an economics which prides itself on 'absolute precision'.[22]

Second, a more general problem of determination can arise for any economics founded upon Sraffa's work. Sraffa generally assumes that the processes and commodities which comprise an economic system are equal in number.[23] Moreover, this assumption is also generally employed by those analysts who have sought the conditions which will ensure economically meaningful determinate solutions.[24] Outside the context of a production structure which involves only produced commodities and contains no joint production, however, this assumption appears to be economically arbitrary. It is, for example, both possible and reasonable to imagine economies where the number of processes which exist is less than the number of commodities which are produced. The determination of the endogenous variables in such a situation is something which is outside the scope of a Sraffa-based economics unless additional assumptions are specified.[25]

BASIC COMMODITIES

As we have seen above, Sraffa assumes that in every system at least one commodity is basic. Now, while this is not an unreasonable restriction to place upon technological inter-dependencies in the analysis of highly industrialised economies, certain problems can arise if it is not met, and these are of special relevance whenever Sraffa's scheme is applied historically.[26] Moreover, these difficulties reinforce the arguments made in the previous sub-sections. We can illustrate this through the use of a simple example.

Assume that an economy is comprised of the following

two production processes:

$$l_1 + k_1 \rightarrow c_1$$

$$l_2 + k_2 \rightarrow c_2$$

where l_1 is the labour required to produce c_1 units of Commodity 1, l_2 is the labour required to produce c_2 units of Commodity 2, k_1 is the quantity of Commodity 1 used as input into itself and k_2 is the quantity of Commodity 2 used as an input into itself. Both commodities are non-basics. If the wage is paid in Commodity 2 and uniform prices are assumed, the rate of profit is determined by the production process of Commodity 2 as

$$\frac{c_2 - wl_2}{k_2} - 1$$

But the production process of Commodity 1 will not be capable of realising this rate of profit at economically meaningful prices if

$$c_1/k_1 < \frac{c_2 - wl_2}{k_2}$$

Thus, if Commodity 1 is to be produced in such circumstances, the assumption of uniform non-negative prices must go.[27]

Furthermore, Sraffa provides no assumption pertaining to the stocks of basic commodities, or, more generally, to the stocks of produced commodities, which exist prior to the beginning of any production period. Instead, his analysis is confined to those cases where, at the beginning of the period, a set of produced inputs of precisely the composition required can be pulled forth.

This characteristic is also manifest in the work of Ricardo and Marx. They dealt with the problem by utilising 'some' theory of supply and demand.[28] These forces were conceived to operate dynamically in such a way as to result in the equilibrium configurations they analysed. This is most

unsatisfactory for two reasons. First, no analysis was presented of any such convergence properties. Second, such an argument is inconsistent with their stated position on the causal emptiness of supply and demand theory with respect to the determination of equilibrium magnitudes. If the forces of demand and supply operate in disequilibria to bring about changes in economic magnitudes, then an equilibrium set of magnitudes can be represented as being determined by such forces.

Although Sraffa's work is not open to these particular objections, nevertheless there remains the problem, for those seeking to rehabilitate Classical and Marxian political economy, of specifying the economic processes which operate to bring about the economic systems which are analysed.

7   CONCLUSION

It is clear that Sraffa's book may be classified as a 'great work' in economic theory. It reflects both an acute insight and great logical powers. However, its impact to date has lain predominantly in critical analysis of other theories. Any attempt to go beyond this, and rehabilitate Classical and Marxian political economy, so as to form a system of comparable strength to that of modern neoclassical economics must surmount the difficulties we have outlined. In the absence of this the dominant position of the latter will undoubtedly be maintained.

NOTES TO CHAPTER 7

1. Sraffa (1961, pp. 305—6) and Bose (1975, p. 11).
2. See, in particular, Blakley and Gossling (1967), Bruno, Burmeister and Sheshinski (1966), Burmeister (1968), Garegnani (1966, 1970), Miyao (1977), Morishima (1966), Newman (1962), Pasinetti (1966, 1977, 1980a) and Tucci (1976).
3. Notably Garegnani (1970, 1976), Eatwell (1976) and Roncaglia (1978).
4. See also Meek (1973, 1977), Dobb (1973) and Roncaglia (1978).

5. There are two other types of commodity considered by Sraffa. These are scarce natural resources, whose supply is fixed by nature, and 'obsolete' means of production that can be produced technologically but the production of which would not cover costs of production at the prevailing prices, wage and rate of profit. Labour-power is not considered a commodity.

6. With a positive rate of profit prevailing and with all prices and the wage positive, the assumption of self-replacement obviously needs strengthening slightly so that a surplus of produced commodity outputs over inputs is possible.

7. Distinct in the sense that no process can be represented as a linear combination of the others.

8. See, for example, Sraffa (1960, pp. 59, 74—5 and 90—1).

9. See also Manara (1968) and Steedman (1980).

10. He does, however, specify the economic characteristics of non-basics. See Sraffa (1960, pp. 49—51, 74, 78). See also Steedman (1980) and Pasinetti (1980b).

11. 'Only by treating capital goods at different stages of wear and tear as *qualitatively* different goods, so that each capital good newly defined can serve only for one period, can we adequately deal with the age structure of capital' (Morishima, 1969, p. 89). See also Morishima (1969, ch. 6) and Morishima (1973, ch. 13). Sraffa attributes the origin of this conceptualisation to Torrens, but it is usually associated with the von Neumann growth model.

12. This discussion ignores certain complications which arise when non-produced means of production exist and also the defects exposed by Manara (1968) and Steedman (1980).

13. Actually there are an infinite number of basic systems corresponding to any actual system because the units in which the multipliers are expressed have not been defined. We assume some convention has been adopted whereby this degree of indeterminacy has been closed.

14. Actually there are an infinite number of multiplier sets corresponding to each R because the unit in which the multipliers are expressed has not been defined. Again we assume some convention has been adopted whereby this indeterminacy is abolished.

15. See also Sraffa (1960, pp. 61—2). And Blakley and Gossling (1967), Burmeister (1968), Pasinetti (1977) and Miyao (1977).

16. See also Sraffa (1960, p. 18).

17. See Manara (1968) and Steedman (1980).

18. There are certain limitations on this procedure, however. It cannot deal with the case where inputs and outputs are continuous in time. Furthermore, to keep processes finite in number the over-all processes from which they are derived have to terminate in some period.

19. See, for example, Steedman (1977, pp. 103–5).
20. See the references in note 2 above.
21. See, for example, Pasinetti (1977, pp. 109–10), Roncaglia (1978, pp. 63, 103) and Zaghini (1967).
22. Sraffa (1961, pp. 305–6) and Bose (1975, p. 11).
23. Or, more accurately, that the number of commodities with positive prices is equal in number to the number of processes. Commodities with a zero price can be ignored as economically irrelevant.
24. See, for example, Pasinetti (1980a).
25. In dealing with this problem, Steedman (1976), for example, assumes, *inter alia*, that the commodity composition of the real wage is exogenously given. The reasonableness of this particular assumption, especially in the context of modern capitalism, is highly suspect.
26. As it is, for example, by Meek (1973).
27. Pasinetti (1977, p. 109) would say that these two production processes do not constitute an 'economic system'. However, to say this is to say nothing substantive, and is in fact a peculiar use of the term 'economic system'. After all, nothing precludes the two commodities from being perfect complements in consumption.
28. We say 'some' theory because its specification was never made explicit.

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CHAPTER EIGHT

The Sraffian Contribution: An Evaluation

G. C. Harcourt[1]

Ronald Meek wrote one of the most perceptive reviews of Piero Sraffa's 1960 classic, *Production of Commodities by Means of Commodities*.[2] The perception started with the title, 'Mr Sraffa's rehabilitation of Classical economics' and continued through to the last part (IV). There, Meek was the first to discern the connection between Sraffa's *standard* system and commodity and Marx's average industry – 'an industry in which the "organic composition of capital" is equal to the "social average" ' (1967, p. 176). In particular, Meek considered the roles that they respectively played in a theory of the origin of profits in the capitalist mode of production and the correct meaning to be given to the labour theory of value in the Classical, Marxist tradition: 'One very important feature of Sraffa's analysis remains to be commented upon – his implied rehabilitation of the Classical labour theory of value in something very like the form which it assumed in the hands of Marx' (Meek, 1967, p. 175). While with hindsight we now might feel that the emphasis in Meek's account lent too much towards the aspect of relative prices and too little towards the aspect of the origin of profits – non-labour incomes – in the capitalist mode of production, there is no doubt that Meek was far closer to Sraffa's intent than were most reviewers. In the second edition of his *Studies in the Labour Theory of Value* (1973) and in his last collection of essays, *Smith, Marx and After* (1977), Meek emphasises again the Sraffian connection with Marx and how much of the

Marxian project can be either redone and/or completed because of Sraffa's contributions. On this particular issue, moreover, his emphasis moved in the more relevant direction.

In between there have been, of course, many other assessments of Sraffa's work. The most notable include Roncaglia's authoritative evaluation, *Sraffa and the Theory of Prices* (1978a), Steedman's controversial *Marx After Sraffa* (1977), and the coming of Piero Sraffa to America in Levine's hands ('This age of Leontief . . . and who? An interpretation', 1974). Perhaps most significant, because the authors themselves were intimately in contact with Sraffa over many years and acknowledge explicitly that their work and interpretations are based on their discussions with Sraffa as well as on their reading of his work, and, of course, because of their own original contributions, we have the work of Krishna Bharadwaj (1978), the late Maurice Dobb (1973), Eatwell (1977) and Garegnani.[3] Joan Robinson also has been an acute and helpful interpreter of Sraffa's work. In addition, she has acknowledged generously in many places the great influence of Sraffa's work on her own. Some of the messages that she takes from it, however, have not been, in recent years anyway, always in accord with those of the authors mentioned above, especially Garegnani. Moreover, her view on the relationship between the analysis in Sraffa's 1960 book and Marx's labour theory of value, as she herself says, is not accepted by Sraffa: 'I must insist that this is only my view. Piero has always stuck close to pure unadulterated Marx and regards my amendments with suspicion' (Robinson, 1979a, p. 285, n. 2).

We also have the Marxist critics, not so much of Sraffa himself (though he has not entirely escaped) as of the so-called neo-Ricardian school. The most important are Rowthorn (1974), Roosevelt (1977) and, possibly, Shaikh (1977). I say 'possibly' because it is doubtful whether Shaikh intends to criticise Sraffa's work as such.[4] It seems an appropriate time, then, to try and take stock of Sraffa's influence and impact. It is, of course, sad that the untimely death of so loveable a man and fine a scholar as Ronald Meek should be the occasion for me to attempt to do so.

SECTION 1

Roncaglia (1978a) has listed Piero Sraffa's published writings
to the end of 1976. (Paul Samuelson was disappointed that
it went to more than one page!) While it is clear that the
1960 book represents the culmination of his life's work, it
is still necessary to view it against the background of his
other contributions, especially the 1925 and 1926 papers
and the edition (with the late Maurice Dobb) of Ricardo's
works and correspondence (1951—5), and his political phil-
osophy and activities, especially his close associations with
Gramsci and Wittgenstein.[5]

Sraffa came to the writing of *Production of Commodities*
steeped in the works of the Classical political economists and
Marx and with a thorough knowledge of the writings of
Marshall, of Wicksteed and of the continental neoclassicals.
He had a deep understanding of what Krishna Bharadwaj has
called the 'rise to dominance of supply and demand theories'[6]
that are associated with Jevons and the early Austrians,
Marshall, Walras, Wicksell and Wicksteed, not only of what
was involved in the analysis itself but also why these move-
ments occurred when they did and what their significance
was. Many of his views are only implicit, or are contained in
hints in the Preface and appendices to the 1960 book,
especially the appendix on 'References to the literature'
(pp. 93—5) and in various asides. For example, on page 9,
we are told that 'the present context . . . contains no reference
to market prices' and that 'the term "cost of production" has
been avoided . . . as well as the term "capital" in its quantita-
tive connotation . . . because these terms have come to be
inseparably linked with the supposition that they stand for
quantities that can be measured independently of, and prior
to, the determination of the prices of the products'.[7] I do
believe that his over-all views are not *that* different from the
thesis advanced by the late Maurice Dobb in his last book,
Theories of Value and Distribution since Adam Smith (1973),
a thesis which Dobb arrived at independently from examining
the same evidence, for, as far as I know, Dobb and Sraffa
never discussed, at least in detail, either Dobb's 1973 Marshall

lectures (which were, in effect, a precis of the central arguments of the book) or the book itself.

In the view of both Dobb and Sraffa, Marshall was the person principally responsible for creating the illusion of a continuous line of development which ran from Smith and Ricardo through Mill to his own work, rather than to Marx's.[8] In the process, the fundamental surplus approach to production, value and distribution was lost and the supply and demand approach took over. Thus, what for Ricardo was a minor chapter at the back of the *Principles*, chapter XXX 'On the influence of demand and supply on prices', was brought to the forefront of the analysis and the Classical concept of the natural price was subsumed in the concept of the long-run normal equilibrium price – and emasculated in the process. The latter itself was argued to be the outcome of the equally important, symmetrical, independent and opposing forces of supply and demand; it was separated from the concepts of market price (assiciated with a stock supply) and short-run equilibrium prices (associated with flows) by the time periods involved as much, or more, as by whether the forces at work were transitory, unsustained, or random, as opposed to sustained and fundamental, or dominant, as in the Classical schema. In the process, concepts that were quite alien to Classical thought were introduced, especially the nature of change (in the context of price formation as opposed to that of accumulation, growth and distribution), schedules as opposed to points, a subtle transformation in the meaning and the scope of application of the laws of returns, equilibrium and marginalist notions generally.[9] A key shift is that from the notion of long-run positions to long-run *equilibrium* positions which are quite unclassical in conception (though even Ronald Meek and Joan Robinson have referred at places, and in Classical and Marxian contexts, to long-run *equilibrium* prices).[10] The point is that while supply and demand *may* have the effect of driving the levels of actual prices towards those of natural prices, the latter *themselves* are not determined by the forces of supply and demand. While it is Garegnani rather than Sraffa who in a number of places has taken up and forcefully emphasised this point, especially

in his debates with Joan Robinson,[11] there seems little doubt that it is one with which Sraffa would fully agree.

SECTION 2

It is true that much of *Production of Commodities* is concerned with the structure of relative prices (of production) and the influences of different values of the wage (and, then, the rate of profits) on their patterns in a given situation or state of the economy. This has led some commentators to see Piero Sraffa as a latter-day Ricardo, as Blaug (1968, p. 144) has said, to see *Production of Commodities* as 'the sort of book Ricardo might have written if only he had gone straight to the point without ifs and buts'. With this perspective, which is very much a reading through neoclassical eyes and emphases, it also has been natural for commentators to interpret the brilliant Sraffian contributions of the *standard system* and *standard commodity* as the 'solution' to Ricardo's search for an invariable standard and measure of value – a solution that, though successful in one dimension, was also one which showed that in the most important sense, as far as Ricardo was concerned anyway, the search had been one for a will-o'-the-wisp.[12]

It is always possible in the economic systems (of circulating commodities and single-product industries anyway) considered by Sraffa to find a unique standard commodity which can be used as the measure of value with which to observe the different patterns of prices as we consider different values of a distributive variable. Nevertheless, *that* standard commodity is uniquely defined for *only* one position of the economic system concerned. As soon as we consider another position, i.e. a later or different snap-shot, in which either the level and/or composition of output and activity have changed and/or technical advances have been embodied in the processes of production, we have another standard system and commodity implied, and so no way of making a comparison, between one position and the other, of the magnitudes and distributions of the surpluses involved. Thus, when Ricardo

identified *two* causes of changes in relative natural prices — first, different values of the distributive variable, and second, technical advances, so that embodied labour values were changed — yet wished to find a measure of value which would allow unambiguous statements to be made about the size and distribution of the surplus over time, he did not realise that he had set himself an impossible task in trying to solve for the effects of both aspects at the same time. Sraffa's contribution makes this absolutely clear, and Roncaglia (1978b) has put the point very neatly in his contribution to the *New Left Review* translation of the Italian symposium on 'The unknown Sraffa'. Roncaglia adds that Sraffa's contribution 'is . . . [one] of utmost theoretical importance [especially] for its bearing on the problem of the relationship between Classical economics and Marx'. Roncaglia suggests that labour embodiment 'preserve[s] a certain meaning' for the second purpose, that of coping with the effects of technical advances over time, but adds 'that the problem is in danger of assuming metaphysical or subjectivist dimensions (labour as a "sacrifice and chore")'.

Finally, in so far as we are concerned with the bearing of the standard system and standard commodity on Ricardian-type puzzles, we should note the following: while we may say, using the standard commodity as our yardstick, definite and simple things about relative shares in the standard system as we consider different values of the exogenous distributive variable, it does not follow that the same things necessarily can be said about shares in the *actual* system, at least not quantitatively (though we *can* say simple things about the wage—rate of profits relationship of the actual system). Sraffa states all this explicitly on page 23, but others have not always been as careful and have made stronger claims concerning actual relative shares than either the author or the analysis itself would allow. The point is a relatively simple one, once we remember that in the actual system, as opposed to the standard system, the *actual* national income may amount to — command — different amounts of the same standard commodity as we consider different values of the exogenous distributive variable.[13] It remains therefore to be shown that in general, *in the actual system*, there is at least a *qualitative*

hostility between the two, i.e. that a higher value of one implies a lower value of the other, even after allowing for the 'change' in the total to be shared.

As a slight digression we also may note that Burmeister has linked Sraffa's result, that there is a unique standard commodity for each position of the economy, to his argument that Sraffa must assume constant returns to scale in his analysis or it will be confined to dealing with 'irrelevant questions' (1977, p. 70). But surely it is relevant to show that a question has been posed to which there is — or may be — no logically rigorous answer, except that there cannot be one. This, after all, is Arrow and Hahn's (1971, pp. vi–vii) major justification for modern general-equilibrium theory:

> [A] long . . . line of economists from Adam Smith to the present have sought to show that a decentralized economy motivated by self-interest and guided by price signals would be compatible with a coherent disposition of economic resources that could be regarded . . . as superior to a large class of possible alternative dispositions . . . [I]t is important to know not only whether it *is* true but also whether it *could be* true . . . In attempting to answer the question 'could it be true?', we learn a good deal about why it might not be true.[21]

So what is sauce for the goose (geese?) is sauce for . . . The alternative is to follow Burmeister's own methodology in this context, which is to choose assumptions so as to provide rigorous and precise answers to irrelevant questions.

SECTION 3

We leave aside the digression and return to the main argument. The interpretation above of the standard system and standard commodity is not unreasonable as far as it goes — but it does not go nearly far enough. In adopting it we tend to forget, what Meek already had explained very clearly and forcefully in his review article of Sraffa's 1960 book, that the standard system and commodity, and the expression that may be

derived from them,

$$r = R\,(1 - w)$$

(where r = rate of profits, R = maximum rate of profits, and w = the wage measured in terms of the standard commodity and as a share of the standard national income), are related to Marx's concept of the average industry and his theory of the origin of profits in the capitalist mode of production.

I believe this to be the central message which Sraffa wished to get over, that is to say, painlessly to teach modern economists, many of whom are innocent of Marx's writings in detail and are suspicious of, or often hostile to them in general, an important lesson of Marx. Schematically, the line which runs from Ricardo to Marx to Sraffa may be shown as follows:[14]

$$r = \frac{\text{Corn as output} - \text{Corn as capital, i.e.}}{\text{Corn as capital, i.e. advances of}} \quad \text{(Ricardo of the}$$
$$\text{necessaries to labour} \qquad Essay)$$

$$\text{(8.1)}$$

$$1 + r = \frac{\text{Total labour}}{\text{Labour in necessaries}} \quad \text{(Ricardo of the } Principles\text{)}$$

$$\text{(8.2)}$$

In Marx's terms, this becomes:

$$1 + r = \frac{s + v}{v} \tag{8.3}$$

and for Marx himself:

$$r = \frac{(s + v) - v}{v + c} = \frac{s + v}{c} \times \frac{c}{c + v} \times \frac{s}{s + v}$$

$$= Rk\left(1 - \frac{v}{s + v}\right) \tag{8.4}$$

where $(s + v)/c$ is the maximum rate of profits, R, $c/(c + v)$

is the organic composition of capital, k, s = surplus value, v = variable capital, c = constant capital, all measured in terms of labour -time.

Because the wage is paid out of the surplus in Sraffa's formulation, we have:

$$r = \frac{s}{c} = \frac{s+v}{c} \left(1 - \frac{v}{s+v}\right) \tag{8.5}$$

(Note that there is now no longer a place for the organic composition of capital in this formulation.)

Finally, in Sraffa's analysis, (8.5) becomes:

$$r = R(1-w) \tag{8.6}$$

rigorously measured in terms of the standard commodity, as Meek showed long ago.

Nor does the story stop here. Garegnani has pointed out the essential similarity between the standard system, standard commodity approach of Sraffa's book and his own approach through the concept of the integrated consumption or wage-goods industry. He first introduced this concept in his 1959 Ph.D. dissertation and used it to good effect in his 1970 *Review of Economic Studies* paper and in his 1977 essay, which is soon to be published in the *Oxford Economic Papers*. In the last paper he shows that if w is given — for the purposes of analysis, that is, at the place and point in time where we cut into the system to start the analysis — then r *for the whole economy* is determined by the labour commanded by the wage goods themselves and the labour commanded by the direct and indirect amounts of labour needed to produce them, using the techniques of production at the time, and taking account of the 'time' processes of production. Both approaches serve to 'give transparency to a system and render visible what was hidden' (Sraffa, 1960, p. 23). They do, of course, contradict Marx's (sometime) view that the rate of profits depends upon *all* industries, and not just upon the wage-goods industries (see Howard and King, 1975, pp. 155, 177, n. 41).

SECTION 4

Returning now to Sraffa's discussion of prices, we note again that it is firmly in the Classical tradition in that he is concerned with natural prices. As Eatwell, (1977), in his reply to Levine and Burmeister, has pointed out, there are considerable differences between what is taken as the data of the problem for a discussion of prices in the Classical tradition and what is taken as given in the neoclassical tradition. Eatwell (1977) lists the two sets as follows:

> the *data* of the classical analysis . . . which represent a particular *state* in the *process* of development of the economy through time, are . . .
>
> (i)   the size and composition of output,
> (ii) the technique in use,
> (iii) the real wage (a 'bundle of commodities').
>   . . . the analytical core of classical theory (p. 62).

The *data* of neoclassical theory are . . .

(i)   preferences of the individuals,
(ii) the initial endowment of commodities and/or factors of production,
(iii) the distribution of the initial endowments between individuals, and
(iv) the technology (p. 65).

We are thus concerned with a snap-shot (as Roncaglia has it) of the economy at a moment of time (or, at least, for a particular production period). We ask the question: what is the pattern of natural prices, or prices of production, associated with this given state of affairs? To answer this we impose an, exogenously given, uniform value of w or of r — Sraffa, in the end, settles for r — and then work out the resulting structure of prices and the value of the other, simultaneously determined, distributive variable.

Why do we assume a uniform wage rate or rate of profit? (Hahn (1975) has criticised the assumption of the latter, on the grounds that it is empirically and, often, theoretically

false.) Because, since Adam Smith at least, the tendency to a uniform rate of profit through capitals relentlessly seeking the most profitable opportunities has been a dominant characteristic of the dynamic processes involved in the development of competitive capitalist economies. (Clifton (1977) argues that the process is even more relevant and illuminating today because the mobility of capitals has become greater not less as capitalism itself has developed.) With it is associated the Classical notion of the long-run position of the economy, the outcome of sustained and fundamental, or dominant, forces which create those centres of gravitation of the system. This is a methodology which has been characteristic of economic analysis until the publication of Hicks's *Value and Capital* in 1939 and the introduction of the method of temporary equilibrium, with 'all the difficulties and complications of an analysis where the outcome depends on expectations the assumptions about which can be varied almost indefinitely [so that] the theory becomes barren of definite results' (Garegnani, 1973, p. 365).[15] Garegnani has argued this point of view most forcefully, not only in the context of his own critique, together with Sraffa's, of neoclassical analysis, but also in his exchanges with Joan Robinson concerning what constitute the most telling thrusts of the critique itself.[16] Garegnani sees 'the rise to dominance of supply and demand theories' and the attempt to embody them within the traditional methodology as the chief source of weakness, whereas Joan Robinson has argued that it is the comparison of long-run positions, equilibrium ones in the case of neoclassical analysis, in order to try to illuminate historical processes, which is the fundamental flaw in orthodoxy.[17]

As the long-run positions in the Classical tradition are not the outcome of the opposing forces of supply and demand, it is not possible to interpret long-run normal prices as the same thing as, or, at least, an evolutionary theoretical improvement upon natural prices. Yet this false identification clouds much of the discussion of the limitations and irrelevancies of the so-called neo-Ricardian contributions. For example, it runs through the entire structure of Hahn's (1975) response to the thesis of two competing roads running out of the Classical

tradition, one to Marx, the other to the neoclassicals, which Dobb advanced in 1973. Witness his remark, '[T] here is not a single formal proposition in Sraffa's book which is not also true in a General Equilibrium model constructed on his assumptions' (Hahn, 1975 p. 362), as though mathematical identity necessarily implies the equivalent economic interpretations. As Eatwell (1977, p. 66) says:

> [While] there is a superficial resemblance between the classical idea of prices depending on the conditions of production, and the Non-substitution Theorem . . . the resemblance is illusory, for the logic of the analysis underlying the two results [is] quite different. The apparent similarity derives from assumptions that eliminate the possibility of substitution [so that] the basis of . . . neoclassical theory is assumed away, and neither prices nor the distribution of income can be determined by the relations of demand and supply.

Again, Walsh and Gram (1980) show very clearly that while Classical and neoclassical general-equilibrium theory often share the same formal structure, the contexts of the models are entirely different. The former is concerned principally with the dynamic creation, extraction and allocation of the surplus between further accumulation and luxury consumption as a result of the decisions of the accumulating class, i.e. the capitalists. The latter, even when it is set ostensibly in a neoclassical growth model, is concerned with the allocation of an arbitrarily given set of initial endowments between alternative ends by individuals whose class is irrelevant for the formal analysis itself. Since Sraffa is in the former tradition, he is right to take the view that his model is concerned with production of commodities by means of commodities, i.e. with the circular interdependence of production and consumption, as opposed to the 'one-way avenue that leads from "factors of production" to "consumption goods" ' (Sraffa, 1960, p. 93) which is characteristic of the neoclassical tradition. Viewed in this way, even without the possibilities of substitution in production processes, the *economic* contexts of the two approaches are entirely different.

In addition, there arises a confusion concerning the nature of the (Classical—Marxian) rate of profits and (neoclassical) rates of return (or interest rates), concepts which, though sharing the same dimension, nevertheless belong to completely different contexts. As Walsh and Gram (1980, p. 236) say so well:

> the interest rates . . . derived in a [neoclassical] model of the allocation of resources over time, are not . . . linked to the concept of surplus, since surplus is not defined in the quantity relations of the model [whereas] the [rate of profits] of classical theory . . . arises *only* when a surplus is defined.

It is ironical that they invoke Hahn's plea to avoid 'the source of much controversy and muddle' when they add

> that we shall insist on a *conceptual* distinction between the commodity interest rates of neoclassical theory (in which inputs and outputs are differentiated according to delivery dates) and the [rate of profits] of classical theory (which is associated with capitalist relations of production in the allocation of surplus output) (ibid).

Hahn and others like him would do well also to consider the carefully reasoned and well-researched arguments of Milgate's (1979) paper 'On the origin of the notion of "intertemporal equilibrium" '. Milgate concludes his discussion:

> [T]o represent the development of economic analysis from 1870 . . . to the present day as a process of 'progressive formalization' is seriously to obscure the fundamental shift to the notion of intertemporal equilibrium. One often hears the claim that modern economic analysis deals with 'more complex' questions (that is, 'general' as opposed to 'special' cases) than did the economics of the nineteenth and early twentieth century . . . more correct to say . . . that it deals with an entirely different question (p. 9).

In the body of the paper, Milgate plots very clearly the change

in the question that occurred partly as a response to the difficulties which arose in the attempts to develop a coherent theory of the uniform rate of profits within a long-run framework using supply and demand analysis. This question was dropped and the different questions concerning own rates of return and patterns of intertemporal prices in a temporary intertemporal equilibrium setting took its place. That is to say, Milgate shows convincingly

> that the chief impetus towards the formulation of this notion of equilibrium resided in a growing realisation . . . that if the demand and supply approach to the theory of capital and interest was to be retained something would have to be done to free it from the bounds imposed by its need to work in terms of a 'quantity of capital' (p.1).

Moreover, it is hardly surprising that Sraffa would reject a supply and demand interpretation, given the arguments of his 1926 paper where he showed that, logically, Marshallian supply and demand analysis was confined to the empirically uninteresting case of an industry in which economies were external to the firms but internal to the industry. While Marshall tried always to confine himself to consideration of notional changes at the intersections, the very drawing of the curves of the schedules themselves implied that the actual position of the economy could be away from them so that Sraffa's 1926 critique would be relevant (Bharadwaj, 1978, lecture 2). Sraffa also argued (in *Production of Commodities*) that he was dealing with 'such properties of an economic system as do not depend on changes in the scale of production or in the proportion of "factors" ' (p. v). In such circumstances the marginal product 'just would not be there to be found'.

This statement has mystified many. Some have seen it as a denial of maximising behaviour, others as confused, as implying that marginal products, costs and utilities were the hallmark of the neoclassical revolution rather than the unifying principle of the assumption of maximising behaviour under constraints, the implications of which Samuelson explored exhaustively in *The Foundations* (1948). This is the message of Bliss's chapter on marginal products in his 1975 book,[18]

and it has been a stumbling-block to the acceptance of Sraffa's message by many otherwise not unsympathetic to it. That stumbling-block now should have been removed once and for all by Sen's (1978) illuminating comments (in his contribution to the Maurice Dobb memorial issue of the *Cambridge Journal of Economics*):

> [Sraffa's methodology] can be seen as exploring how much can be said about the *interrelations* between prices, distribution and physical quantitative magnitudes using only directly observed data, without making any use of *counter-factuals*. The use of counter-factuals is an essential part of any 'marginalist' analysis (what *would have* happened had the facts been different, e.g. if one more unit of labour had been applied?). Neoclassical equilibrium conditions . . . use such counter-factual displacements as important features. Sraffa's relations involve no counter-factuals whatever, only observed quantities, and in this 'prelude' to a critique of marginalist theory Sraffa analyses propositions that could be made without using any *counter-factual quantities* . . . not only are *demand* equations not used, nor are *supply* equations – only the observed configuration of physical quantities (pp. 180–1, emphasis in original).

Moreover, it seems to me that it *is* possible to analyse the 'laws of motion of capitalist economies' in terms of the system's reproducing and expanding propensities, to discuss the allocation of the surplus between investment and luxury consumption, to allow business people to be ruthless profit-seekers and accumulators, without having to give up the Classical framework which Sraffa provides. Indeed it is a starting-point of the theories of pricing and investment behaviour which figure prominently in post-Keynesian analysis — for example, Sylos-Labini, Wood, Eichner, Harcourt and Kenyon — and it is a combination of Sraffa's and Kalecki's analysis that Joan Robinson, for one, sees as the proper starting-point for a relevant analysis of growth, fluctuations and distribution over time: 'With the light that Sraffa has thrown on the theory of value and Kalecki on the process of

realisation of the surplus, we can develop a complete system . . . of *intelligible* Marxism, and . . . adapt it to the analysis of contemporary problems of capitalism' (Robinson, 1979a, p. 253, emphasis in original). As is well known, over the years Joan Robinson has come to prefer Kalecki's version of the central propositions of the *General Theory* to Keynes's version because they are placed in the context of Marx's schemes of reproduction and a theory of cyclical growth.

As to the negative aspects of Sraffa's contributions, in so far as *some* versions of neoclassical analysis *are* dependent on the concept of marginal products, the logic of their arguments does flounder (outside a one, all-purpose commodity world) on the propositions set out in parentheses in para. 48 of the chapter on reduction to dated quantities of labour[19] and on the related propositions on switches in methods of production of part III of Sraffa's 1960 book. Moreover, as we have seen, in so far as modern equilibrium analysis *is* addressed to traditional questions, e.g. an explanation of the rate of profit, it, too, runs into a logical impasse.

SECTION 5

In this paper I have commented very little on the Marxist critique of Sraffa's work. Partly this is because I have already done this in a review of Steedman's *Marx After Sraffa* (Harcourt, 1979). It does seem to me, however, that Sraffa's analysis of price formation is complementary to Marx's analysis, that it can be fitted into Marx's general system with very little trouble, that, in fact, it fits neatly between the Marxist emphasis on the dominance of the sphere of production (and that the social relationships emanating there are of crucial importance), and the wage, profit and price relationships of the sphere of distribution and exchange.[20] That is to say, it is quite consistent with Shaikh's argument that 'the struggle for production is the fundamental social practice in all human society; hence the analysis of production is the beginning of Marxist analysis' (Shaikh, 1977, p. 110).

NOTES TO CHAPTER 8

1. I am much indebted to Krishna Bharadwaj, Jon Cohen, Bob Dixon, Robert Fisher, Peter Groenewegen, John King, Heinz Kurz, Bruce McFarlane and Peter Sallans for their comments on a draft of this essay.

2. Meek's (1961) review article was originally published simultaneously in the *Scottish Journal of Political Economy* and *Science and Society*; it was reprinted, 'slightly amended', in Meek (1967).

3. Garegnani's views are put succinctly in the interview which he gave on the occasion of Piero Sraffa's eightieth birthday: 'The centrality of [Sraffa's work] is based on *three* different aspects: (1) his discovery of the theoretical approach peculiar to the classical economists; (2) his solution to a number of analytical difficulties that were not resolved by Ricardo and Marx; and (3) his critique of marginalist theories' (Garegnani, 1978a, p. 73, emphasis in the original). It will be obvious that my own assessment owes much to Garegnani's arguments.

4. For an illuminating and balanced assessment of these particular issues see Medio (1977).

5. On this, see 'The unknown Sraffa', Symposium (1978).

6. The arguments of this essay have been much influenced by Krishna Bharadwaj's 1976 R. C. Dutt Lectures on Political Economy (Bharadwaj, 1978). The lectures contain easily the most lucid discussion of the contexts in which the arguments of Sraffa's 1960 book, and contributions generally, are placed, and of the issues with which the book especially is concerned.

7. A possible clue as to why Sraffa chose to write his 1960 book in such sparse prose, to give just enough information to allow the reader to establish each proposition each step of the argument on the way, *may* be found in the 1938 Keynes–Sraffa edition of Hume (1740). Hume wrote in his Preface that 'my intentions are to render a larger work more intelligible to ordinary capacities, by abridging it. . . . those who are not accustomed to abstract reasoning, are apt to lose the thread of an argument, where it is drawn out at a great length . . . each part fortified with all the arguments . . . illustrated with all the views. . . Such readers will more readily apprehend a chain of reasoning, that is more simple and concise, where the chief propositions only are linked on to each other, illustrated by some simple examples, and confirmed by a few of the more forcible arguments. The parts lying nearer together can better be compared, and the connexion be more easily traced from the first principles to the last conclusion'. I am indebted to Peter

Sallans for bringing this passage to my notice. Bob Dixon suggests that the example of Wittgenstein in the *Tractatus* may be another major reason. I recently (1980) asked Piero Sraffa about this interpretation. His reason was more prosaic than my suggested one: 'I don't like writing, so I wrote the book in as few words as possible.'

8. Peter Groenewegen has reminded me that Smith was much more of a supply and demand theorist than Ricardo and that Mill 'who is the true progenitor of Marshall followed Smith rather than Ricardo'.

9. On all this it is instructive to read again – or read for the first time – the opening pages of Sraffa (1926, esp. pp. 535–41).

10. For example, 'The Marxian labour theory of value does *not* say . . . that the equilibrium prices of commodities' (Meek, 1967, p. 175). 'Prices of production correspond to Marshallian normal long-run prices' (Robinson, 1979a, p. 275). In their otherwise superb book, Vivian Walsh and Harvey Gram (1980) also get close at times to the same misconception.

11. See Garegnani (1975, 1978b, 1979a, 1979b) and Robinson (1979b).

12. It is ironical that in the same book Sraffa shows that the search for a unit in which to measure capital which is independent of distribution and prices, so fundamental for the neoclassical tradition, *and* the search for the invariable standard of value, which Ricardo thought to be so fundamental for his system, are both doomed to failure.

13. I am indebted to Byron Brown for bringing home the significance of this point to me.

14. Christopher Gregory has suggested to me that the initial link in this chain is Quesnay. Sraffa himself provides convincing evidence of this viewpoint in appendix D of his 1960 book, 'References to the literature' (see, especially, pp. 93–4).

15. Milgate (1979) argues that the change occurred earlier, in the 1920s, and is to be associated with Hayek as well as with Hicks, Lindahl and Myrdal.

16. See the references in n. 11 above.

17. See, for example, 'History versus equilibrium', reprinted in Robinson (1979a).

18. Chapter 5 'Marginal products and capital', in Bliss (1975).

19. '(The reduction to dated labour terms has some bearing on the attempts that have been made to find in the "period of production" an independent measure of the quantity of capital which could be used, without arguing in a circle, for the determination of prices and of the shares in distribution. But the case just considered seems conclusive in showing the impossibility of aggregating the "periods" belonging to the several quantities of labour into a single magnitude which could be regarded as representing the quantity of capital.

The reversals in the direction of the movement of relative prices, in the face of unchanged methods of production, cannot be reconciled with *any* notion of capital as a measurable quantity independent of distribution and prices)' (Sraffa, 1960, p.38, emphasis in original).

20. Much the same conclusion has been drawn by Wright (1979).

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CHAPTER NINE

The Significance of Marxian Political Economy in the Present-day World

Shigeto Tsuru

SECTION 1

John Maynard Keynes, with his characteristic air of superiority, looked down upon Marx as an economist by placing him 'in the underworlds' in company with Silvio Gesell and Major Douglas.[1] But there are a number of distinguished modern economists who rated highly the contributions which Marx made in the field of political economy, notably Wassily Leontief, Joan Robinson and Joseph Schumpeter. Leontief (1938, p. 78) once wrote of an 'an unsurpassed series of prognostications fulfilled, against which modern economic theory with all its refinements has little to show', and referred to Marx's 'brilliant analysis of the long-run tendencies of the capitalist system' such as 'increasing concentration of wealth, rapid elimination of small and medium sized enterprise, progressive limitation of competition, incessant technological progress accompanied by the ever growing importance of fixed capital, and, last but not least, the undiminishing amplitude of recurrent business cycles'.

In Schumpeter's case, not only was his appraisal of Marx's contributions as an economist commendatory,[2] but his ideas on many of the issues connected with capitalistic development were surprisingly, though with his own admission,

similar to those of Marx. For example, he wrote:

> The capitalist process not only destroys its own institutional framework but it also creates the conditions for another... The outcome of the process is not simply a void that could be filled by whatever might happen to turn up; things and souls are transformed in such a way as to become increasingly amenable to the socialist form of life. With every peg from under the capitalist structure vanishes an impossibility of the socialist plan... We can also agree with him in linking the particular social transformation that goes on under our eyes with an economic process as its prime mover (Schumpeter, 1947, p. 162).

Or again:

> Things economic and social move by their own momentum and the ensuing situations compel individuals and groups to behave in certain ways whatever they may wish to do ... not indeed by destroying their freedom of choice but by shaping the choosing mentalities and by narrowing the list of possibilities from which to choose. If this is the quintessence of Marxism then we all of us have got to be Marxists (ibid, pp. 129–30).

SECTION 2

Although all of Marx's writings were done more than a century ago, one is struck, on re-reading them today, by the fresh insight one obtains in relation to contemporary problems. Let me cite a few examples here.

In that classical work by Marx and Engels, *Manifesto of the Communist Party*, written in 1848 — so classical that not many people seem to take pains to read it nowadays — they spelled out the measures that could be taken immediately in the most advanced countries *before, but in preparation for,* the radical revolution in the mode of production. They were clearly thinking in terms of 'a revolution by degrees'. There

are ten measures proposed in this list and include such items
as:

(1) a heavy progressive or graduated income tax;
(2) centralisation of the means of communication and trans-
port in the hands of the state;
(3) extension of factories and instruments of production
owned by the state; the bringing into cultivation of
wastelands, and the improvement of the soil generally in
accordance with a common plan; and
(4) free education for all children in public schools, and
abolition of children's factory labour in its present form.

(All of these are by now accomplished in a number of capita-
list countries.) Marx and Engels also enumerate a few mea-
sures which are more radical than the modern welfare state
is prepared to put into effect, such as:

(1) abolition of property in land and application of all rents
of land to public purpose;
(2) abolition of all right of inheritance; and
(3) centralisation of credit in the hands of the state, by
means of a national bank with state capital and an ex-
clusive monopoly.

But even these measures are approximated in some degree
here and there in the platforms of progressive parties in capi-
talist countries. And one measure which is of particular
interest is: 'Combination of agriculture with manufacturing
industries; gradual abolition of the distinction between town
and country, by a more equable distribution of the popula-
tion over the country.' China, after the revolution, tried to
bring this into effect and caused a great deal of controversy
both inside and outside the country.[13] It is in any case
remarkable that a revolutionary document of 150 years ago
contained a set of gradualist proposals which are more than
ever relevant in the present-day world.

SECTION 3

There are numerous passages in Marx's writings that are strik-

ingly modern. One such example is the following:

> A philosopher produces ideas, a poet poems, a clergyman
> sermons, a professor compendia, and so on. A criminal
> produces crimes. If we look a little closer at the connection
> between this latter branch of production and society as a
> whole, we shall rid ourselves of many prejudices. The
> criminal produces not only crimes, but also criminal law,
> and with this also the professor who gives lectures on crim-
> inal law, and in addition to this the inevitable compendium
> in which this same professor throws his lectures onto the
> general market as 'commodities'. This brings with it aug-
> mentation of national wealth, quite apart from the personal
> enjoyment which . . . the manuscript of the compendium
> brings to the originator himself. The criminal moreover
> produces the whole of the police and of criminal justice,
> constables, judges, hangmen, juries, etc.; and all these
> different lines of business, which form equally many cate-
> gories of the social division of labour, develop different
> capacities of the human spirit, create new needs and new
> ways of satisfying them. Torture alone has given rise to the
> most ingenious mechanical inventions, and employed
> many honourable craftsmen in the production of its
> instruments . . . The effects of the criminal on the develop-
> ment of productive power can be shown in detail. Would
> locks ever have reached their present degree of excellence
> had there been no thieves? Would the marking of bank-
> notes have reached its present perfection had there been
> no forgers? . . . Crime, through its constantly new methods
> of attack on property, constantly calls into being new
> methods of defence, and so is productive as strikes for the
> invention of machines (Marx, 1964a, pp. 375–6).

Is it not likely that few economists today can identify the
author of this passage even if they happen to know something
about Marx? It reminds one of a more recent news item in
the *New York Times* (16 August 1970) with the headline:
'Booming burglar alarm industry finds that fear of crime pays.'

It reported that

> sales, they [manufacturers of burglar alarms] say, are a
> direct reflection of rising crime rates, and the projections
> are for a continuing steep upward trend . . . A typical
> home alarm system protects all exterior doors and windows
> with contact switches or other circuit interruptors. Entry
> when the system is not deactivated with a key or a switch
> usually sounds an alarm, or turns on the lights, or both. In
> some systems, it also alerts the installing company's central
> headquarters, which in turn calls the police. . . . Such a
> system costs about $500 to install with a service charge of
> about $20 to $30 a month.

The passage quoted above from Marx may give the impression
of being facetious in tone, but actually it is of peculiar rele-
vance to the problem, increasingly discussed nowadays, of
whether, or to what extent, an aggregate magnitude like
gross national product or national income can be taken as a
measure of economic welfare. Most economists now feel that
some modifications of GNP are needed to arrive at a measure
of net national welfare (NNW).

But from the Marxian viewpoint the equating, even as an
approximate measure, of GNP with economic welfare involves
theoretical confusion. For 'income' *under capitalism* is
essentially a privatised, atomistic reward in value terms to
factors of production which enter into the exchange econo-
my. There are two points implied here. First, the unit for
measurement of GNP is money value as registered in the
market. If one gram of opium, baneful as it may be, has the
same market value as one kilogram of rice, these two items
are considered equivalent in national income accounting.
Second, no matter to what extent the social character of
production may have advanced, social net product in the
exchange economy is distributed to atomistic agents on the
assumption that the contribution of each agent can be par-
ticularised.

This latter point brings to mind immediately a contrasting
situation which may prevail in 'a community of free individu-
als, carrying on their work with the means of production in

common, in which the labour-power of all the different individuals is consciously applied as the combined labour-power of the community' (Marx, 1964b, p. 78). Distribution of that part of social net product which is destined to consumption in such a community could be effected in accordance with the labour-time contributed by individuals, but it could also be effected on the basis of the principle of 'From each according to his ability and to each according to his needs.' It is likely that as the social productivity of the community progresses the method of distribution will gradually shift in the direction of the latter form.

The first point mentioned above, namely that when aggregated into national income or GNP all goods and services acquire a simple dimension, i.e. that of market valuation, may sound platitudinous enough, but is in fact related to an extremely important methodological issue which was Marx's repeated concern. That is the distinction, and the need for integration, of the real aspect and the value aspect in economic theorising.

Market valuation of goods and services may approximate, under certain conditions, their welfare significances; but it remains incontrovertible that the welfare content of any good or service is essentially concrete and specific. Marx was, no doubt, trying to emphasise this point in a rather sarcastic way as he penned the paragraph we quoted at the beginning of this section. We shall deal with this problem anew in the following section.

SECTION 4

The importance of distinguishing between, and integrating, the real and the value aspects was central in the methodology which Marx adopted. He wrote:

> The labour-process . . . is human action with a view to the production of use-values, appropriation of natural substances to human requirements; it is the necessary condition for effecting exchange of matter between man and Nature; it

is the everlasting Nature-imposed condition of human exis-
tence, and therefore is independent of every social phase
of the existence, or rather, is common to every such phase
... As the taste of the porridge does not tell you who grew
the oats, no more does this simple process tell you of itself
what are the social conditions under which it is taking place,
whether under the slave-owner's brutal lash, or the anxious
eye of the capitalist, whether Cincinnatus carries it on in
tilling his modest farm or a savage in killing wild animals
with stones (Marx, 1964b, pp. 183–4).

And this methodology was best illustrated in the reproduction
scheme which Marx adopted in the analysis of commodity
circulation. In the second volume of *Capital*, he divided, on
the one hand, all the products into producers' goods and con-
sumers' goods. This is a division from the standpoint of
material use of the product and actually transcends the speci-
fic mode of production. That is to say, such a division exists
under socialism as well as under capitalism. On the other
hand, Marx divided all the products into three components
of *value*, namely constant capital (c), variable capital (v), and
surplus value (s). This is a division which is characteristic of
capitalism. Constant capital subsumes the cost of raw materials,
fuel and depreciation, and is so called because these items are
considered to go into the value of the product without
changing their value-magnitude. Variable capital refers to
capital reserved for payment of wages, and is so called
because it is the category which is considered to be the
source of all the new value created and thus finds its *raison
d'être* only if it is variable. Surplus value is the part which,
according to Marx, is a residue out of the new value created
over and above the necessary payment for wages. When we
apply these two principles of division to the total products of
society, we obtain the following six aggregates, in which the
subscript 1 refers to the producers' goods sector and the sub-
script 2 to the consumers' goods sector:

$$c_1 + v_1 + s_1$$

$$c_2 + v_2 + s_2$$

Here in its simplest form is a *tableau* of commodity circulation showing mutually interdependent relations of the real and value aspects. It is in a marked contrast to the Keynesian equation of aggregates, that is:

$$Y = C + I$$

in which Y stands for net national income, C for consumption and I for net investment. This equation has certain convenience for analytical purposes such as the multiplier analysis; but it leads to a confusion, as was the case in the Mahalanobis model (see Tsuru, 1962), if one takes a view that the C-sector and the I-sector, respectively, represents a uniquely identifiable 'economic activity'. We may take such a view only if we can assume that capital goods are non-depreciating permanent assets, which we cannot do in the real world. The difficulty, which actually disturbed Mahalanobis very much, stems from the failure to distinguish the real and the value aspects when such a distinction is essential in empirical analyses.

SECTION 5

The need explicitly to distinguish between, and integrate, the real and the value aspects is even more strongly to be urged when we deal with a kind of problem such as the effects of technology on productivity. The failure to do so in the use of the Cobb—Douglas function resulted, I believe, either in statistical calculations without much meaning or in conceptual confusion, especially as regards the concept of capital (see Tsuru, 1965).

In order that the Cobb—Douglas function be applicable, both capital and labour have to be identifiable in homogeneous physical units. The case of labour may be easier, but the problem for capital is formidable, especially when the function is used in the aggregate form, as is the case with Robert Solow and others in their attempt to measure the part played by technological progress in the growth rate of labour productivity. Numerous economists are aware of this difficulty;

and Johansen (1961), for example, proposed a model (though in terms of an industry production function) which did not require statistical figures for the stocks of capital in the empirical analysis. His claim was that it was sufficient if he could know what he called the 'relative increase in wages', or the ratio between the rate of change in the cost per labour and the rate of change in the cost per unit of capital.

Did Johansen succeed in skirting around the difficulty inherent in the measurement of the stock of capital as used in the Cobb—Douglas function? I believe not. For the rate of profit, or 'the cost associated with the use of capital', is a ratio which, no matter how unambiguous it may be, still presupposes a particular way of measuring the denominator, capital. Between the restrictive concept of capital as a factor consistent with the aggregate Cobb—Douglas function and the concept of capital conventionally used in the calculation of the rate of profit, there is a long series of bridges that have to be crossed; and few of them are easy to cross.

Let us postulate, for example, a world in which there is only one kind of machine. 'Ideally what one would like to measure is the annual flow of capital services' (Solow, 1957). Now, a machine, like a labourer, has a finite life of its own. So long as it is in active use it can be assumed to render more or less the same 'quantity' of service every year. But the *value* of a machine, which is relevant to the profit-rate calculation, depreciates as it nears the end of its life. One might try to get around this difficulty by taking the gross stock instead of the net stock. But, then, a change in the durability of the machine could affect the gross stock magnitude without changing the 'quantity' of current services rendered.[4] Second, a machine, like a labourer, can be improved in its performance capacity through technological progress without any change in durability or in the number of labour-hours required to produce it. Should not such a machine be counted, in the Cobb—Douglas function, as a multiple of the simple machine just as we do the similar adjustment in the case of the labour factor? Third, compare two machines exactly alike in all respects (including their durability and age) except that one is drawn from an economy with a higher product-wage rate. As Joan Robinson pointed out, 'the value of the two machines is dif-

ferent, and the investment required to create them is different. A difference in value remains if we deflate them by the wage rate, for in two economies with different product-wage rates the rate of profit and therefore the rate of interest are different' (1956, p. 247). Furthermore, the real world makes use of a thousand and one different types of machines, both substitutive and complementary. A formidable index number problem arises here.

In other words, capital is essentially a value concept; and one cannot escape from its value implication as affected by the rate of interest, the time pattern of wage-rate changes, etc., unless we assume a radically simplified economy with a one-type machine and no technological change. If Marx were alive today, he would have wrestled with this problem with explicit awareness of the methodological need for distinguishing the real and the value aspects.

It should be conceded, however, that economists like Keynes and Harrod, who played a pioneering role in the development of modern macroeconomic theory, were, in their own way, aware of the peculiar difficulty which presented itself in the matter of the choice of units — the difficulty which stemmed from the double character (the value and the physical) of the production process, especially of the economic system as a whole. In criticising Pigou's method of arriving at the net national dividend by deducting 'normal' obsolescence, Keynes made a revealing comment: 'since this deduction is not a deduction in terms of money, he is involved in assuming that there can be a change in physical quantity, although there has been no physical changes; i.e. he is covertly introducing changes in value' (1936, pp. 38–9). Keynes's solution was, as is well known, to adopt the labour unit and/or the wage unit 'by taking an hour's employment of special labour in proportion to its remuneration' (ibid, p. 41). This is an approach remarkably close to that of Marx, except that in the latter's case 'ordinary labour' as the unit is visualised to change its quality historically.

Harrod, too, wrestled with a similar problem when he posed the problem of whether neutral technical progress required new investment, and answered that it was a question of definition — that the answer depended on whether a

labour standard of value is chosen or a goods standard of value. His preference was for the latter, for a number of reasons which we shall not go into here (see Harrod, 1948, pp. 28–34).

The distinction between a labour standard and a goods standard corresponds to that between the value aspect and the physical (or real) aspect. Whereas microeconomics for a capitalist society can navigate almost entirely in the world of values, macroeconomics, especially of the dynamic type, finds it difficult, as was illustrated in the previous section, to dissociate itself from the real or physical aspect of its subject-matter. In this sense, the fact that Keynes, who was interested more in the short-run problem with no technological change, chose a labour standard, while Harrod, who was concerned with a dynamic economics, chose a goods standard, is easily understandable.

Having said this, I must add immediately that problems in dynamic macroeconomics, so long as it is intended to be economics, cannot avoid dealing with the world of values also, and that our task is a peculiarly difficult one of combining the two aspects in an appropriate manner.

SECTION 6

To distinguish clearly the value aspect and the real aspect, to pursue two-way intereactions between them, and to draw implications from them, was, in fact, the most outstanding contribution of Marx as a social scientist; and armed with this methodological insight, he went on to depict the historical evolution of a society from the tension caused by the contradictions between them. In this connection the basic tenet of his historical materialism — that is, the contradiction between productive forces and productive relations as a propelling mechanism in the evolution of the mode of production — is nothing but the extension of this methodological insight related to the real aspect (productive forces) and the value aspect (productive relations).

The progress of productive forces — the real aspect — may be likened to the rise in temperature of H_2O, while the

specific institutional arrangement of productive relations — the value aspect — may be likened to the forms of H_2O, such as ice, water and steam. And Marx's contention, in a word, was that, under capitalism, as productive forces make progress they are bound to have their *social* character enhanced. This comes into conflict more and more with the *private* character of ownership of the means of production, and according to him this conflict will finally be resolved through 'bursting asunder of the capitalist integument' (Marx, 1964b, p. 763).

However, just before this phrase there appears one of the most revealing passages among Marx's writings detailing probable developments in the interaction between the real and the value aspects under capitalism:

> Hand in hand with this centralisation [of capital], or this expropriation of many capitalists by few, develop, on an ever-extending scale the co-operative form of the labour-process, the conscious technical application of science, the methodical cultivation of the soil, the transformation of the instruments of labour into instruments of labour only usable in common, the economising of all means of production by their use as the means of production of combined, socialised labour, the entanglement of all peoples in the net of the world market, and with this, the international character of the capitalistic regime (ibid).

This was written more than one hundred years ago and it is truly remarkable that the predictive insight revealed here has been to a large extent borne out.

What is still more remarkable is a longer-run prediction Marx made which postulated advances in the use of automation and which again bears on the interactive tension between the real and the value aspects. It reads as follows:

> As large-scale industry advances, the creation of real wealth depends less on the labour-time and the quantity of labour expended than on the power of the instrumentalities set in motion during the labour-time. These instrumentalities, and their powerful effectiveness, are in no proportion to the immediate labour-time which their production requires;

their effectiveness rather depends on the attained level of science and technological progress; in other words, on the application of this science to production . . . Human labour then no longer appears as enclosed in the process of production — man rather relates himself to the process of production as supervisor and regulator . . . He stands outside of the process of production instead of being the principal agent in the process of production . . . In this transformation, the great pillar of production and wealth is no longer the immediate labour performed by man himself, or his labour-time, but the appropriation of his own universal productivity, i.e. his knowledge and his mastery of nature through his societal existence — in one word: the development of the societal individual . . . As soon as human labour, in its immediate form, has ceased to be the great source of wealth, labour-time will cease, and must of necessity cease to be the measure of wealth, and the exchange value must of necessity cease to be the measure of use value . . . The mode of production which rests on the exchange value thus collapses (Marx, 1953, pp. 592, 596).[5]

In Marx's mind was a thesis, as stated earlier, that the development of productive forces inevitably conditions the transformation of the mode of production; and it was his view that the conditions for the atomistic attribution of labour's contribution to final products would inevitably disappear as automation and other forms of application of science to production progressed and the 'societal individual' came to be developed. If the mode of production which rests on the exchange value thus comes to be undermined, it will be only natural that the determination of factor prices (the wage rate and the rate of interest) will lose the market objectivity of impersonal character and will become the product of power relations.

We may be already in such a stage in the evolving mode of production so that private firms (at least in the 'planning system' in the Galbraithian sense) can more or less determine the size of their mark-up ratio, and the organised workers, if strong enough, can successfully obtain their scheduled wage

demands from their employers. To the extent that factor prices are *administered* in such a way instead of being objectively determined in competitive markets, then what is expected of the 'invisible hand' is further undermined. Not only is it the case that the market no longer serves as an impersonal arena through which consumers' sovereign decisions are faithfully conveyed to suppliers, but it must further be admitted that factor markets do not perform the function expected of them of objectively determining the rates at which factors are rewarded in proportion to their contributions to the total product. In fact, we may have come to a stage in our technical progress where it is becoming increasingly difficult to relate the marginal input of a factor to the incremental output.

The passage quoted above from Marx actually goes a step further than this by looking towards a stage in the evolution of the mode of production where 'labour time will cease, and must of necessity cease to be the measure of wealth, and the exchange value must of necessity cease to be the measure of use value'. In other words, society approaches the conditions, cited earlier, of 'a community of free individuals, carrying on their work with the means of production in common, in which the labour-power of all the different individuals is consciously applied as the combined labour-power of the community'. There, the concept of 'income' will also radically change; and the principle of 'To each according to his needs!' will prevail.

Of course, it is true that we have not yet come to such a stage; but the evolution of the mode of production in the direction indicated can already be observed. And it is the contention of this essay that Marx's unique predictive power in this regard was based on his methodological insight which explicitly set store by the need to distinguish between, and integrate, the value aspect and the real (or physical) aspect.

NOTES TO CHAPTER 9

1. Keynes (1936, p. 32). In fact, he thought less of Marx than Gesell, as can be surmised by his remark that 'I believe that the future will learn more from the spirit of Gesell than from that of Marx (ibid, p. 355).

2. Schumpeter wrote that Marx 'was the first economist of top rank to see and to teach systematically how economic theory may be turned into historical analysis and how the historical narrative may be turned into *histoire raisonné*' (Schumpeter, 1947, p. 44).
3. See in particular Wheelwright and McFarlane (1973).
4. On this point, Solow (1957, p. 314) simply says that 'there is nothing to be done about this'.
5. Translated into English in Marcuse (1964, pp. 35–6).

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