

## PAPERING OVER THE CRACKS

by Geoff Hodgson

*Comments on Fine and Harris' Survey of the Current Controversy  
Within Marxist Economics1*

### I

An important article by Ben Fine and Laurence Harris entitled 'Controversial Issues in Marxist Economic Theory' appeared in the last *Socialist Register*. It has an integrated structure and is free from the Fundamentalist habit of settling debates by quoting huge chunks of Marx, in appeal to divine authority. For these and other reasons it cannot simply be brushed aside. It demands a reply, both from the so-called 'Fundamentalists' and 'Neo-Ricardians' who are the objects of its criticism.

As one of the 'Neo-Ricardians' mentioned in the article I have attempted to reply to some of their more fundamental points. But I have not the space to deal with their entire survey. I have chosen to deal with the thorny question of the theory of value. I regard this question as the most fundamental as a theory of value must be the theoretical foundation and starting point of any comprehensive analysis of the capitalist mode of production. This does not mean that other issues, such as the economic role of the state, are less important. But they are part of the theoretical superstructure, and the theoretical basis must receive first attention. In addition we shall examine the implicit claim of Fine and Harris to stand in between, and above, the hubbub of controversy between Fundamentalists and Neo-Ricardians: seeming to synthesise with an air of scientific moderation. In our view, despite its powers of seduction, this claim is unfounded.

### II

Fine and Harris make a valid and very important point when they stress the need to see 'production, exchange and distribution. . . as members of a structured whole' (p. 142) and correctly rebuke those which may over-emphasise either production, or exchange, or distribution. Fine and

Harris' account of the need to understand this 'complex structure' is useful and positive.

It is also pleasing to note a measure of critical detachment on this issue. The authors give a belated but welcome statement that Marx's formal solution to the transformation problem is wrong, unlike the Fundamentalists who get themselves into a real mess still trying to prove that Marx's internally inconsistent and inadequate solution is correct. They have been late in making their views widely known on this issue, but their statement is still welcome. Furthermore they suggest that Marx's formal errors in attempting to solve the transformation problem may arise because his 'integration of production (and distribution) with exchange is one-sided' (p. 147). This may not be the whole story but it is still a useful insight which must be pursued.

This welcome and valid criticism of Marx, on an issue where criticism of Marx has evidently been appropriate for 70 years,<sup>2</sup> is in strange contrast to a statement that appeared in a recent Fine and Harris article in *New Left Review*. In this they assert that criticisms that derive from a 'different problematic' to that of Marx himself 'cannot be considered as definitive criticism'.<sup>3</sup> The problem with this position is that it can render the theoretical position of Marx, Malthus, Mussolini, or anyone else, theoretically impregnable. Since Fine and Harris give no criteria to distinguish a 'different problematic' from one which is substantially the same, *any* unwelcome criticism of Marx can be ascribed to a 'different problematic' and rejected *for that reason*. Yet there must be a hidden rule which allows Fine and Harris to criticise Marx, whilst disallowing the objections of those that may cry that the Fine and Harris criticism stems from a 'different problematic'. Perhaps the hidden rule disallows all those who do not fully appreciate the 'complex structure' of 'production, exchange and distribution'. But, as Fine and Harris point out, Marx himself was not *fully* aware of all the ramifications of that appreciation. The consistent application of this principle of a 'different problematic' to assess other criticisms of Marx seems dangerously close to dogmatism, despite the intentions of its authors.

### 'Neo-Ricardianism'

After making a reasonable start with an account of the 'complex structure' within the capitalist mode of production, Fine and Harris then apply it in a questionable manner to the protagonists in the debate: 'For Fundamentalists, the sphere of production is determinant. Indeed it is the only sphere of economic activity that they analyse in a consistent manner.' On the other hand: 'For neo-Ricardians all analysis of the capitalist economy takes place in the spheres of exchange and distribution. . . both are only examined in isolation from the sphere of production.' (p. 144)

From then on the errors of the two schools seem to appear in plain

view. All fault derives from lack of appreciation of the complex totality. But on close inspection a number of questions and problems arise. Why is the 'neo-Ricardian' label used? Is it appropriate? How do we determine if a piece of analysis is 'neo-Ricardian' or 'Fundamentalist'? What are the relevant criteria? Are these criteria mainly to do with matters of exclusion or emphasis in a piece of analysis?

It is true that Ricardo did give prominence to questions of distribution. The more important issue, however, is to examine the work of Sraffa. All the 'neo-Ricardians' mentioned by Fine and Harris are strongly influenced by Sraffa's original and seminal work in the theory of value which appeared in 1960 entitled *The Production of Commodities by Means of Commodities*. It is amazing that Fine and Harris completely fail to analyse any segment of Sraffa's work or point to any criticism of it in their article. This failure to discuss Sraffa is remarkable in an article which purports to survey a controversy which was largely created in the wake of Sraffa's work. Only too often has Sraffa's work been dealt with simply by the use of the 'neo-Ricardian' label, whilst avoiding any serious examination of that work. Fine and Harris go one further—they ignore Sraffa completely (except in the bibliography).

(For the non-specialist, we include a brief account of Sraffa's theoretical system in an appendix to this article.)

It would be wrong to argue that Sraffa's work is beyond criticism. It has certain faults, of a sort, and we shall come to these in a moment. But it is argued that the 'neo-Ricardian' label is inappropriate for Sraffa and most of his followers, and it only serves to maintain confusion. Furthermore, it gives the mistaken impression that the whole of the current debate is simply an action replay of a contest between Marx and Ricardo himself. Sraffa is not examined or concretely refuted; he is 'dealt with' by association with Ricardo. Consequently the profound originality and uniqueness of Sraffa's contribution is completely ignored. An 'it is all in Marx' approach is thus encouraged by the use of the neo-Ricardian label and the dangerous impression might be gained that political economy cannot in principle be further developed after Marx. Once again Fine and Harris inadvertently steer close to the very Fundamentalism that they aim to criticise.

It is true that to some extent Sraffa chooses a similar compass of enquiry to that of Ricardo, at least in the first few chapters of his *Principles*, focusing mainly on relations of distribution and exchange-value. But the similarity does not go a great deal further. In fact some of Ricardo's prominent conceptions are actually refuted by Sraffa. First, Sraffa's book does not vindicate the labour theory of value but implies that it is redundant, by giving a formal determination of prices and profits from physical and labour quantities, completely bypassing any notion of embodied labour. This demonstration is hardly compatible with Ricardo's (and Marx's) labour theory of value. Second, Ricardo asserted that prices

will be proportional to amounts of embodied labour within 'six or seven' percent, but Sraffa's analysis leads to the conclusion that no such proportionality can generally be assumed. Third, Ricardo believed, as did Marx,<sup>4</sup> that a reduction in the amount of labour embodied in a commodity, through some technical change, would lead to a reduction in its exchange-value. This proposition can easily be refuted with the use of Sraffa-type analysis.

On one important point, however, Sraffa and Ricardo both endorse a correct proposition which was unconvincingly rebutted by Marx. We refer to the statement that the general rate of profit is determined solely by the conditions of production in those industries which directly or indirectly produce the real wage. It is relatively easy to produce arguments and examples in support of this proposition.<sup>5</sup> Presumably, as Fine and Harris see the fault in Marx's solution to the transformation problem, and endorse Seton's formally correct solution, they must agree with this so-called 'neo-Ricardian' proposition which is implicit in all formally correct solutions to the transformation problem, including Seton's.

It appears that the 'neo-Ricardian' label is highly inappropriate for Sraffa and his followers, for most of the basic features of his theory of value are quite different from those of Ricardo's. In fact, in many respects Sraffa's work is the antithesis of Ricardo's *Principles*. Furthermore, it is simply not possible to categorise the participants in the current controversy within Marxist economics by arranging them on a line that stretches simply between Ricardo and Marx. A new dimension has been introduced with Sraffa's revolution in the theory of value.

### *Symptomatic Silences in Sraffa*

However, we can find in Sraffa what Althusser would call 'symptomatic silences'. For instance the dynamics of the production process and the determinants of technical change are ignored in Sraffa's work. The driving forces of competition are assumed to have done their work at the outset. The analysis of money and uncertainty is sidestepped. These issues cannot be ignored in any complete analysis of the capitalist mode of production. However, there is a strong case for clemency. Sraffa's work is subtitled *Prelude to a Critique of Economic Theory*. Can Sraffa, therefore, be indicted for these sins of omission when he never claimed to develop a complete analysis of the 'complex structure'?

Furthermore, the recognition of such silences in Sraffa's work does not, in any sense, undermine the *formal correctness* of his theoretical edifice. The cost of abandoning Sraffa's work is nothing less than the cost of abandoning logical consistency. Perhaps some will argue that we must reject formal logic and adopt 'dialectics'. Presumably 'dialectical logic' allows one to contradict oneself! In fact, the inevitable result of abandoning formal logic for the purposes of theoretical exposition is to

descend into pure nonsense. Sraffa's work, whilst not telling us *all* about the capitalist mode of production, confining our attention to merely a few aspects of it, does enable us to talk about value and distribution without allowing nonsense or logical inconsistency to pollute our statements.

### *Who is What?*

Fine and Harris liberally apply the 'neo-Ricardian' label. However, the sole criteria for its application seems to be the emphasis and chosen area of study of the person concerned, rather than the content of the produced work in that particular field. If a person had concentrated on Sraffa-type analysis and ignored other aspects of the 'complex structure' he or she is due for the 'neo-Ricardian' label. It seems that the only way to avoid being labelled one thing or another by Fine and Harris is to write about everything at once and not specialise in one particular aspect of the analysis of the capitalist economy. The approach can be made to boomerang on Fine and Harris themselves, for if an unsympathetic and mercilessly polemical person were to examine the body of work produced by Fine and Harris it would be noted that they too have their specialisms and emphasised areas of research.

The label-daubing approach will not do. No person can be condemned for choosing a particular field of study. He or she can, however, be criticised if the results of that field of study are regarded as sufficient and complete for an understanding of the entire complex organism. But few, if any, of Sraffa's followers have regarded Sraffa-type analysis as the be all and end all. The label-daubing approach deflects attention from the content of the research that has gone on in specialised areas. This is particularly serious in the case of Sraffian analysis for no economist has found fault in the inherent logic of that type of analysis. We may regard such analysis as insufficient, we may even go so far as to say that it is much less important than other modes and areas of analysis, but that does not mean that we can abandon our duty to state the fact that Sraffa's analysis is formally correct.

### III

### *Value Analysis*

Naturally, the word 'value' appears on numerous occasions in the Fine and Harris article. These writers will know that a lot of the 'controversial issues in Marxist economic theory' revolve around different interpretations and definitions of that very word. But its ambiguity is never acknowledged by the authors, neither do they provide a clear definition of what *they* take the word to mean. Simply from the context of their remarks, I assume that they define value as the socially necessary embodied abstract labour

time needed to produce a commodity, and I shall adopt that definition for the remainder of this article. From this definition at least two things are clear: first, the concept value applies to a commodity-producing society only, where goods are produced for sale on the market, and second, value is measured in hours of human labour-time.

Fine and Harris acknowledge (pp. 148-9) that the rate of profit (in price terms) will generally be distinct from the rate of profit calculated in value terms that, for instance, is found in *Capital*. They then direct this question at the so-called 'neo-Ricardians': 'Why is the price (rather than value) rate of profit, for example, a central concept for understanding capitalist development?'. They find no valid reason why it should be so, and seem to come to the conclusion that the rate of profit in value terms will be the more fundamental and determining of the two, mainly because it asserts 'the priority of production'.

We shall discuss the relative importance of the rate of profit in value terms in a while, but first we must note an implicit myth in Fine and Harris' argument. It is the myth that values have some special relationship with 'the sphere of production' and much less of a connection with the exchange-process. This myth is common in orthodox Marxist literature, and it encourages a special reverence for the word 'value'. It must be admitted, of course, that as labouring activity can go no nowhere else but in the 'sphere of production' labour as such does have a special relationship with that sphere. But that does not mean that *socially necessary embodied abstract labour* has such an obvious special connection to production, more than the sphere of exchange. This association of value with production is all the more strange because Fine and Harris repeatedly insist that value must be related to the commodity-form. The commodity-form, of course, cannot be defined or considered in production alone; it has an essential relation to exchange. We are entitled to ask the authors two pertinent questions. First, why is it that analysis in terms of values automatically asserts the priority of production? Second, when we consider the sphere of production what role does value analysis play in it? Orthodox Marxists have failed to supply a convincing answer to either question; in most cases they simply rely on tautological arguments or appeals to the authority of Marx's writings. They simply *assert*, without explanation, that surplus value is the source of profit, that value is the hidden essence of the production process, and so on. It is on these controversial issues that the debate amongst Marxists has hinged. Unfortunately, Fine and Harris simply repeat the old Fundamentalist assertions, with no additional argument.

### *'Technical' Relations and Values*

The matter is taken further when Fine and Harris applaud the work of Seton on the transformation problem. Seton, according to them, is

alleged to 'transform values into prices of production without reference to the technical relations of production that are so fundamental to neo-Ricardianism' (p. 152). Hence Seton's analysis is held up as a suitable alternative to so-called 'neo-Ricardian' solutions. This conclusion is simply amazing.

First, at the *purely formal* level the solutions of Sraffa and other so-called 'neo-Ricardians' are formally identical to that of Seton. All these solutions are based on a matrix of coefficients whose elements are the quantities of the various commodities in the economic system. Clearly, we must choose a unit of measurement or numeraire to measure each of these commodity amounts. For example, they may be measured in tons, ounces, metres, cubic centimetres, or, significantly, units of embodied labour time. Hence Sraffa's solution to the transformation problem can be 'read' as a 'Marxist' solution simply by stipulating that all the quantities of the various commodities are to be measured in units of embodied labour time. At the purely formal level there is no difficulty in doing this, unless, perhaps, zero or negative embodied labour values rear their ugly heads. (Both Morishima and Steedman have shown that embodied labour values can be negative but Fine and Harris never comment on these published results.)

Second, the 'neo-Ricardians' are rebuked for basing their theory on 'technical relations', *but how are the embodied labour values of commodities to be determined other than by reference to technology?* There is simply no way of calculating quantities of embodied labour other than by reference to the physical quantities of commodities, and the amounts of living labour time, involved in the process of production. This must involve a reference to 'technical relations'. But that, of course, does not mean that we can regard productive technology as asocial or independent of social relations.

Third, some Marxists will, with justification, object to one important feature of Seton's solution to the transformation problem. Seton does not deal with the workers' real wage separately from the physical inputs or means of production. He thus adopts the same procedure as von Neumann, in his famous article on general economic equilibrium, and some of the followers of Sraffa, but not Sraffa himself. According to this procedure labour-power is formally treated the same as a machine; labour as such is ignored and the labourer is represented only by the physical inputs that are necessary to sustain him, i.e. food, clothing and shelter. It is thus doubly difficult to deal with such matters as the struggle over the length of the working day, speed-up and so on. Quantities of living labour are completely ignored in the transformation scheme. It is amazing, therefore, with all their emphasis on 'the sphere of production', that Fine and Harris specially endorse Seton's solution. In contrast to Seton, Sraffa's implicit solution to the transformation problem, which generally treats labour-

time separately from the real wage, is superior in this respect at least.<sup>6</sup>

### *Value and Price Rates of Profit*

We have already noted that Fine and Harris seem to regard the rate of profit in value terms as more 'fundamental' than the rate of profit in terms of prices. They supply no reason, other than the vaguely asserted connection of 'value' with 'the sphere of production', why the value rate of profit is of any significance whatsoever.

When comparing the value and price rates of profit it is important to note that they are both determined by quite different sets of conditions. It is a well known theorem, endorsed by all formally correct solutions to the transformation problem, including Seton's himself, that the price rate of profit is determined by the conditions of production only in those industries which directly or indirectly produce the real wage, i.e. the wage-goods industries and the industries producing the capital goods to be used in those industries. Consequently, those industries which produce luxury goods not consumed by the workers, or capital goods that are used to produce such luxury goods only, play no part in determining the general rate of profit in price terms. We have already referred to arguments and examples which support this proposition (cf. reference 5). As Fine and Harris endorse Seton's solution we must presume that they have no argument with this theorem.

In contrast, the rate of profit in value terms will depend on the conditions of production of those industries producing mink coats, vintage wine and Centurion tanks. Such commodities are surely removed from the central process of capitalist reproduction and accumulation, despite, perhaps, their social or political role? The reproduction and accumulation of capital depends vitally upon those commodities which can be used as means of production (i.e. capitalist goods) or means of reproduction of labour-power (i.e. wage goods). In their determination to regard the value rate of profit as 'fundamental' Fine and Harris depart from the central process of reproduction and accumulation of capital itself.

Fine and Harris rebut the argument, which I constructed elsewhere,<sup>7</sup> that the rate of profit in price terms is the more fundamental regulator of economic performance in the economy as a whole. This argument is based on the fact that individual capitalists calculate their rate of profit in terms of prices, not values. Capitalists are neither able nor inclined to determine the rate of profit in terms of embodied labour-time. Fine and Harris (p. 151) really miss the vital point in this argument. They correctly imply that it is erroneous to regard social phenomena as a simple aggregation of individual behaviour. But they do not realise that the equalisation of a general rate of profit in price terms, in the economy as a whole, follows from the individual behaviour of the capitalist through the *social*

*mechanism* of the equalisation of the rate of profit in a competitive capitalist mode of production. The economy *as a whole* will be in equilibrium when the rate of profit is equalised in price terms, because, given the capitalist relations of production, the individual capitalist will not be able to gain by shifting investment from one sector to another. We can conclude, therefore, that the rate of profit in price terms is both more important and more fundamental to the inner workings of the capitalist system.

### *The Falling Rate of Profit*

Fine and Harris give a reasonable account, with one or two distortions, of the debate on Marx's theory of the tendency of the rate of profit to fall. They reproduce and endorse the arguments of Hodgson, Steedman, Sweezy and others that a rise in the ratio of physical means of production to the quantity of employed labour does not necessarily result in an increased 'organic composition of capital'. (We adopt the same definition of the latter term that Fine and Harris utilise in their article, despite their, perhaps justified, misgivings). The 'organic composition of capital' is calculated as a ratio of *value* quantities, and the increase in the physical mass of machinery does not necessarily involve an increase in the socially necessary labour embodied in that machinery, due to productivity increases in the sectors producing those means of production.

Fine and Harris then turn to an important article by Himmelweit which is also critical of Marx's theory of the falling rate of profit. Again, on close inspection, they manage to find no real fault in its arguments. Himmelweit shows that the rate of profit will, in general, not fall unless wages, measured in terms of some commodity-numeraire, actually rise. Fine and Harris do not refute this argument. They simply assert the following: 'in Marx's approach based on the law of value, wages will rise, since to maintain equality between wages and a constant value of labour-power, wages must rise as productivity rises.' (p. 165) Fine and Harris nowhere clearly explain what is meant by the 'law of value' neither do they explain why Marx's assumption of 'a constant value of labour-power' is justified or appropriate. Of course, if we assume at the outset that the value of labour-power is constant and that productivity, naturally, is increasing, then it follows *as a tautology* that wages, measured in terms of physical commodities, will rise. What is under question is the *assumption* that the value of labour-power must, necessarily, be constant. The only conclusion that Fine and Harris manage to reach in commenting on Himmelweit's article is that the rate of profit will tend to fall if the value of labour-power is constant and *if* the 'organic composition of capital' rises. A tautology of course, and hardly an innovation in this theoretical area! What they fail to do is show *why* we must make their necessary assumptions.

Himmelweit is curtly dismissed with this remark: 'For Himmelweit a distributional phenomenon, the movement of the wage rate, is primary and the motive force' (p. 164). First, is it correct to typify the wage rate as merely 'distributional' (a procedure adopted by Fine and Harris but not by Himmelweit?). Surely, part of the determination of wages takes place in the 'sphere of production' itself, through the operation of piece-rates overtime availability, production bonuses, and the very productivity in the industries that produce the real wage. Second, Himmelweit does not state or imply that wages are the 'primary and motive force'. Her concern is to investigate formal *relationships* between profits and wages. Again, correct formal arguments are dismissed simply by false association.

Fine and Harris' main defence of Marx's theory consists of an assertion that the law was not designed to predict falls in the (value or price) rate of profit. They write:

**'The burden of our own interpretation is that the existence of both the tendency of the rate of profit to fall and of counteracting influences has the status of a law in the sense that both are inevitable products of capitalist accumulation. One cannot preface the counteracting influences with the adjective "mere" . (p. 167)**

Although this interpretation of Marx's law is empirically, and in some respects theoretically, more satisfactory than the Fundamentalist view that the rate of profit must actually tend to fall, there are a number of objections to it. First, it is, in fact, a misinterpretation of Marx's position. Marx wrote:

**'But in reality, as we have seen, the rate of profit will fall in the long run.'**<sup>9</sup>

When Marx discusses the 'counteracting influence', of, in particular, the 'cheapening of elements of constant capital' he makes it clear that this influence is an 'isolated' case rather than a general tendency:

**'In isolated cases the mass of the elements of constant capital may even increase while its value remains the same or falls.'**<sup>10</sup>

As Fine and Harris acknowledge, we have no reason to regard this 'counteracting influence' as such an isolated case. But on the whole it appears that Marx did think that the rate of profit will fall in the long run, and that the 'counteracting influences' would be less influential than the actual 'law'.

Let us turn to the question of the theoretical status and impact of Fine and Harris' peculiar interpretation of the 'law'. To them it does not matter, theoretically, whether or not the rate of profit *actually* falls. We are meant to understand the 'law' as a 'dialectical' unity of tendencies which

lead to a fall in the rate of profit, and counter-tendencies of equal impact and status which lead to the opposite result. The astounding feature of this 'dialectical' interpretation is that it does not matter what happens in the real world as far as the vindication of the 'law' is concerned; it is valid if the rate of profit has a tendency to fall, and it is valid if the rate of profit has a long-run tendency to rise! We remain to be convinced of the *empirical* significance of Fine and Harris' interpretation.

On the theoretical front, Fine and Harris really stretch things when they argue that the 'law' of the tendency of the rate of profit to fall has the same significance and theoretical status as the 'counteracting influences' which would lead it to rise. Why then does Marx refer to the 'law of the tendency of the rate of profit to *fall*' and *not*, as Fine and Harris put it, 'the law of the tendency of the rate of profit to fall *and* of the tendency for counteracting influences to operate' (p. 162). A suitable paraphrase of the latter, resulting from Fine and Harris' insistence that the 'law' and 'counteracting influences' have equivalent theoretical status is: 'the law of the tendency of the rate of profit to *fall or rise*'. A remarkable and penetrating theoretical result! Why then does a set of propositions that Fine and Harris advocate remain a 'law' at all?

If we remove the word 'law' and the various genuflections to Fundamentalism, Fine and Harris' position is quite close to the view held by the so-called 'neo-Ricardians'. As it has been expressed elsewhere:

**'We are led to an agnostic conclusion. There is no necessary reason for the rate of profit to have a tendency to fall over time. . . .'**

### *Conclusions*

Whilst having some positive and useful features, Fine and Harris' article still remains trapped within Fundamentalist rhetoric. At critical points in their argument they rely on pure assertions, for example playing to the gallery with the statement that 'value' is fundamental because it is linked to the 'sphere of production'. Not only are such statements unsubstantiated but also they will not help to extricate Marxist economic theory from its own internal crisis.

In one respect their position is actually worse than some Fundamentalists, particularly Mandel, who realise that Marxist economic theory must actually have something to say about empirical reality, without necessarily descending into an empiricist epistemology.<sup>12</sup> Fine and Harris' conception of categories such as the rate of profit, and the law of its alleged tendency to fall, has little or nothing to do with phenomenal appearances and little possible contact with empirical reality. This negativist attitude to empirical data is one of the most sterile features of their position.

Other Fundamentalists, however, will not be comforted by Fine and

Harris' rejection of Marx's solution to the transformation problem and the adoption of a formally correct solution. They also raise other pertinent criticisms of the Fundamentalist approach.

On one important issue their article severely fails as a survey of the current debate. We refer to their complete silence on the question of Sraffa's work. The impact of the latter has not yet fully percolated through the Marxist movement, but that does not allow the authors to give it only slight recognition. In addition it must be emphasised that Fine and Harris have not supplied one single direct criticism of either the logic or the basic assumptions of those that use Sraffa-type analysis. Given such an absence of substantial criticism, other than label-daubing and the 'proof' of guilt by association, it cannot be long before the effects of the Sraffa revolution in economic theory are felt more deeply within Marxism. Even if that revolution is confined to a small but vital element of the corpus of economic science it cannot be ignored or shunned. Fine and Harris may attempt to paper over the cracks but a renovation of Marx's theoretical structure cannot be postponed much longer.

#### NOTES

I am indebted to Ian Steedman for comments on an earlier draft of this paper. Final responsibility is, of course, entirely mine.

Bortkiewicz's correct solution to the transformation problem first appeared in **1907**.

3. *New Left Review*, No. **98**, July/August **1976**, p. **101** n.

4. *Capital*, vol. **3**, Moscow **1962**, pp. **174, 176**.

5. See, for example, G. Hodgson, 'Marxian Epistemology and the Transformation Problem', *Economy and Society*, November **1974**, pp. **366-8, 389-90**. See also appendix to this article.

Fine and Harris do not make it clear that Seton, himself, is far from being an orthodox Marxist. In his famous article on the transformation problem (*Review of Economic Studies*, vol. **24**, p. **160**) he writes:

'While the internal consistency and determinacy of Marx's conception of the transformation process, and the inferences he drew from it, have been fully vindicated by this analysis, the same cannot be said for the body of the underlying doctrine. . .'

7. G. Hodgson, op. cit., pp. **362-3, 372-3, 382-3**.

8. Fine and Harris write: 'only neo-Ricardians could in the first place conceive of an economy where wages are zero' (p. **165**). This debating trick is founded on a refusal to see the difference between a theoretical construct and the actual situation in the real world. Marx, according to Fine and Harris, would be a neo-Ricardian for he wrote: 'two labourers, each working **12** hours daily, cannot produce the same mass of surplus-value as **24** who work only **2** hours, even if they could *live on air*.' Marx, op. cit., p. **242**, emphasis added.

9. *Ibid.*, p. **255**, emphasis added.

10. *Ibid.*, p. **231**.

11. G. Hodgson, *Trotsky and Fatalistic Marxism*, Spokesman Books, **1975**, p. **71**.

12. Fine and Harris severely distort my own epistemological position when they assert that I 'reject as metaphysical any theories which do not yield predictions concerning observable phenomena' (p.175). Not only do I abstain from using the word 'metaphysical' in this context but also I actually argue against the view that valid theories are those which simply yield correct predictions. See Hodgson 'Marxian Epistemology and the Transformation Problem', pp. 375-9; 'Exploitation and Embodied Labour Time', *CSE Bulletin*, March 1976, pp. 7-8.

## APPENDIX

### THE FUNDAMENTALS OF THE SRAFFA SYSTEM

It is the purpose of this appendix to give a brief account of the Sraffa system, as presented in his *Production of Commodities by Means of Commodities*. An attempt has been made to make this account understandable to the non-economist, but it has been necessary to use a little elementary algebra. For purposes of brevity much of the Sraffian apparatus has not been discussed, and our account is concentrated on the 'fundamentals' in the first few chapters of his book. In particular, we have excluded discussion of Sraffa's 'standard commodity', joint production, fixed capital, and reswitching.

Unlike Sraffa, this exposition is centred on a single example. Sraffa's exposition is posed in general terms, and he derives general results. However, in this appendix the key results that are derived also have a general significance, and the example we choose is not just a fluke.

Consider an economy in which just three non-labour commodities are produced: corn, bread, and diamonds. Labour-power is also a commodity so the economy is a capitalist one. Consider a production cycle of one year. One ton of corn, sown on the ground, produces ten tons of corn at harvest, one man-year of labour being required. Five tons of corn can be turned into four units of bread with one man-year of labour. Also one man-year of labour will mine one unit of diamonds in that year.

We can represent this simple capitalist economy in the following schema:

INPUTS					OUTPUTS		
corn	bread	diamonds	labour		corn	bread	diamonds
1	0	0	1	→	10	0	0
5	0	0	1	→	0	4	0
0	0	0	1	→	0	0	1

Clearly, the three rows in the above schema represent the corn, bread, and diamond industry, respectively.

Sraffa's work concentrates on the question of the exchange ratios between the commodities. Note that we have assumed that labour is homogeneous. Sraffa also makes that assumption, but his system can be extended to cover the case of heterogeneous labour. Like Marx, and others who have produced simple economic models in this vein, Sraffa assumes that there is a uniform wage rate ( $\mathbf{w}$ ) and a uniform rate of profit ( $r$ ) in the system. It may appear justified to remark that Sraffa (and Marx) are dealing with a capitalist system in economic equilibrium, therefore. But we shall not discuss the latter proposition, as it is one of interpretation.

Without introducing a monetary unit into the system we have to choose

a numeraire in which exchange-values and wages are to be measured. As there is no money, this choice is an arbitrary one. We shall choose corn. Let the price of bread in terms of corn be  $p_b$  and the price of diamonds in terms of corn be  $p_d$ . (The reader may be justified in pointing out that prices do not exist without money, and we should have used the term 'exchange-value' in the latter sentence. However, we shall follow the usual terminological convention and use the term 'price'.)

Now, it is a simple accounting identity that costs plus profit must equal revenue from sales in each industry. This accounting identity follows from the very definition of the terms 'cost', 'profit' and 'revenue', so it cannot be contradicted in this context. Consider the corn industry. The only costs are seed-corn and labour, so the total cost in this industry is  $1 + w$ . (Recollect that all prices are in terms of corn.) The total revenue in the corn industry is 10. As the rate of profit is  $r$  profits are  $(1 + w)r$ . (Note that profits, as usual, are calculated as a fraction of total costs.) As a result we get the following accounting identity:

$$(1 + w)(1 + r) = 10. \quad \text{Equation 1}$$

Consider the bread industry. Total cost is  $5 + w$ . Total revenue is  $4p_b$ . Profits are  $(5 + w)r$ . We get:

$$(5 + w)(1 + r) = 4p_b. \quad \text{Equation 2}$$

Consider the diamond industry. Total cost is simply  $w$  as there are no other costs than labour. Total revenue is  $p_d$ . Profits are  $wr$ . We get:

$$w(1 + r) = p_d. \quad \text{Equation 3}$$

(Note that unlike Sraffa himself, but like some of his followers, we have adopted the practice of assuming that wages are paid at the start of the production period and thus profits are calculated with the wage as part of total cost. However, this assumption makes a negligible difference to the substantive argument.)

We have constructed three equations. Together they include four unknown quantities (i.e.  $w$ ,  $r$ ,  $p_b$ ,  $p_d$ ). It would be necessary to include one extra equation to solve or complete the system. However, it is possible to derive some important relationships without adding an extra equation. For, instance, re-arranging Equation 1 we get a formula for wages in terms of the rate of profit:

$$w = \frac{10 - r}{1 + r} \quad \text{Equation 4}$$

Contrary to some commentators on Sraffa, it is not necessary to posit which is the dependent and which is the independent variable. We can make wages dependent on profits, or we can make profits dependent on wages, or we can make them mutually interdependent. Apart from one casual remark on the rate of interest Sraffa does not enter into this question of determination; he simply elucidates relationships. One important observation that we can make is that there is a non-linear relationship between wages and profits. Also there is a maximum rate of profit: in our example it is 9. (Wages and profits must, of course, like prices, all be positive.)

Two further relationships can be derived. From Equation 2 and Equation 4 we can eliminate  $w$  and get an equation for the price of bread in terms of the rate of profit:

$$3.5 + r = p_b. \quad \text{Equation 5}$$

Similarly, from Equations 3 and 4 we get a formula for the price of diamonds:

$$9 - r = p_d. \quad \text{Equation 6}$$

We now have shown the relationships between prices, wages and the rate of profit. Note, however, that the particular relationship between wages and the rate of profit was derived from Equation 1 only. The equations pertaining to the bread and diamond industries played no part in that relationship. Clearly this is because both bread and diamonds are not an input or an output in the corn industry. In the real world, commodities that did enter as inputs or outputs would, in general, have to be considered. (An important exception is those inputs that enter *only* into the production of commodities which do *not* appear as an input in the system.) Sraffa calls commodities such as corn in our example 'basic'. Bread and diamonds are 'non-basic'. It is clear that the rate of profit is determined by the conditions of production in the basic industries only, unless we can show that the conditions of production in the non-basic industries somehow influence the wage rate.

We could, however, assume that the real wage, i.e. the wage measured in terms of the actual commodities received by the workers for one man-year of labour, was given. Let us assume that the workers receive 1 unit of bread per man year, and they spend all their wages on that. Hence

$$w = p_b. \quad \text{Equation 7}$$

From Equations 1, 5 and 7 we get:

$$(4.5 + r) (1 + r) = 10$$

This gives us a quadratic equation:

$$r^2 + 5.5r - 5.5 = 0$$

There are two solutions, but only one of them will yield positive prices. It is

$$r = 0.8645 \text{ (approx.)}$$

It is evident that having determined the real wage the rate of profit is then determined. And the rate of profit is determined in those industries which directly or indirectly enter into the production of that real wage (i.e. bread and corn, respectively, in our example). The conditions in the diamond industry are irrelevant as diamonds serve as a luxury good for the capitalists only. This is a clear difference with Marx's solution to the transformation problem, for in the latter it is erroneously assumed that the conditions of production in all industries necessarily affect the rate of profit.

To summarise what has been done so far, we have determined the rate of profit (and we could easily proceed to determine relative prices) from information regarding the real wage and the technical conditions in production. It is not an empirical, but a logical and theoretical argument. If the Sraffian results are to be contested it can only be on the basis of (a) the initial assumptions made, or (b) the logic of the argument. No economist has found such a logical error. And although the initial assumptions have their limitations they are often used in Marxian and non-Marxian literature. It is necessary, therefore, to concede that, as far as they go, the Sraffian arguments are correct.

If we do concede the latter than we do not necessarily bind ourselves to a particular view of, for example, the labour process, or the determinants of capital accumulation. These issues lie outside the terrain of the formal Sraffian argument. That is not to say, of course, that such issues are unimportant—far from it.

Finally, we turn to the question of quantities of embodied labour. To determine these in our example we must work from the technological coefficients as presented in the schema. In every case there is no other way. Let the labour embodied in one unit of corn, bread and diamonds be  $l_c$ ,  $l_b$  and  $l_d$ , respectively. The labour embodied in the inputs, plus the living labour employed, must equal the labour embodied in the outputs, in each industry. Hence:

## APPENDIX

$$l_c + 1 = 10l_d$$

$$5l_c + 1 = 4l_b$$

$$1 = l_d$$

Clearly  $l_c = \frac{1}{9}$ ,  $l_b = \frac{7}{18}$ ,  $l_d = 1$ .

From inspection of Equations 5 and 6 prices will be in proportion to quantities of embodied labour only if the rate of profit is zero. Also it should be obvious that the technological coefficients in the schema are necessary to determine both prices and profits and quantities of embodied labour. In other words the technological data is primary, embodied labour quantities and prices being secondary. Note that we have *not* asserted that the technological data is asocial in character. To say that technological conditions determine prices and profits in some way does not necessarily involve such an assertion. Neither does it involve an investigation into the forces which themselves determine the technological relations in production. Such a question is highly important, but it is not answered in Sraffa's book.

### *Bibliography*

Apart from Sraffa's book itself the uninitiated reader could consult the following three review articles of that work:

Joan Robinson, 'Prelude to a Critique of Economic Theory', in E.K. Hunt and J.G. Schwartz (eds), *A Critique of Economic Theory*, Penguin Books, **1972**.

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Ronald Meek, *Economics and Ideology and Other Essays*, Chapman and Hall, **1967**, pp. **161-78**.