

Production, circulation and value:

the significance of the 'transformation problem'

in Marx's Critique of Political Economy

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Abstract

The Marxian transformation problem is usually thought of as bridging the transition from 'essence' (value) to 'phenomena' or surface (prices). This paper shows that such a conception is incorrect. The transformation is actually between two theoretical levels of the construction of the economic region of the capitalist mode of production. The first of these levels is *production in itself* (*Capital*, Volume I), while the second is the complex unity of production and circulation (*Capital*, Volume III). This theoretical construction is complicated for two reasons: (1) despite the fact that production is the dominant instance, the social relationships of commodity production appear only in circulation; (2) circulation categories appear *implicitly* even at the level of *production in itself*.

These considerations establish the transformation problem at the heart of a correct conception of the capitalist mode of production. Thus the sharpest distinctions between neo-Ricardianism, vulgar Marxism and Marxism can be drawn here. In particular, it is shown that a correct appreciation of the transformation problem proves the inadequacy of an instrumentalist conception of the state since, at least in this area, bourgeois class interest arises only at the level of class and is not the sum of individual interests (even over a subgroup of the class).

Finally, the transformation problem itself is reviewed in detail. Mathematical results are separated from the essentials of the problem which are shown to lie in the correct choice of normalization, a choice that insures the transformation will actually be from value to modified value and not from value to price.

1 Introduction: Marxism, classical political economy and vulgar economics

There has been recently a growing awareness that the dominant economic models of the postwar period must be rejected. This

awareness is marked by a search for theories that will better take into account and explain the realities of the contemporary capitalist world economy; realities that include, to name only a representative few, monetary crises, inflation, increased levels of unemployment, and more open international capitalist competition, as well as the growing political strength of communist parties and a not yet completed series of political realignments working out the new power relations that were made manifest by the defeat of the United States in Southeast Asia.

The need for new theoretical understanding is felt on both sides of the class struggle, by defenders of capitalism and by critics who would overthrow it, as each seeks to ground political strategies in the context of events that do not fit comfortably into formerly accepted paradigms. For the bourgeoisie the hegemony of bourgeois ideology is vital. Vast financial and institutional resources are available to create and maintain a coherent and practical ideological framework with which to view the world. The nature of the capitalist mode of production dictates that economic theory be the linchpin of this ideology. When this aspect of ideology begins to crack, its reconstitution is a matter of urgent necessity. The most coherent and institutionalized attempt to carry out this reconstitution, on a basis that it is hoped will be better able to comprehend the contemporary world, is found in the neo-Ricardian attack on the neo-classical synthesis.¹

The search for new approaches on the left has been less sharply focussed, the major reason being the relatively low level of class struggle that has existed in the theoretical realm. This, itself, is related to the overall state of the class struggle, as well as, more specifically, to the disorienting and corrosive effects of the existence of bourgeois ideology within the left. To the extent that there has been a dominant model for the left in the postwar period (at least in the United States), it is the tendency put forward by the journal *Monthly Review*, its publishing house Monthly Review Press, and given popular form in Baran and Sweezy's *Monopoly Capital*. This work stems from neo-Keynsianism as much as from Marx's critique of political economy and as such it must be rejected. However, it has much more to say that is of value than does the neo-classical synthesis, and, as a result, a left critique of it is bound to be more muted and subtle than is the neo-Ricardian critique of the neo-classical school.² It is the point of view of this paper that the starting point of the radical reconstruction of economic theory must be those elements of Marx's theory that break decisively with bourgeois thought and ideology.

Of course, if a return to Marx is to be part of a convincing analysis, it must amount to more than a return to the mechanistic positions of

the Second and Third Internationals, which themselves did not break sufficiently with bourgeois ideology.³ In part, it was their rejection of dogmatic and undialectical readings that enabled Baran and Sweezy to provide an interpretive framework that appealed to a great number of people in the 1960's. What is needed is a theory that breaks decisively with *all* forms of bourgeois ideology. For this a careful and searching appraisal and reconstitution of Marx's critique, in a form that can be used in the conditions we find ourselves in today, must be undertaken.

A curious parallel thus emerges. For the left the renewal of economic theory involves a critical rejection of recent models in favor of a return to Marx's critique of political economy. For bourgeois theory it implies a similar rejection of postwar formalism in favor of a return to Ricardo.

The return to Marx, on the one hand, and to Ricardo, on the other hand, is not all that surprising. If we expand the perspective somewhat it is possible to see the mid-1960s as the termination of 100-some-odd years of capitalist expansion, rather than simply as the end of the anomalous post-World-War-II period. This is not meant to raise the false issue of the 'final crisis,' but it does imply that a significant boundary has been crossed. It will be possible to argue convincingly for such a periodization only after more information is in, and more theoretical work is done, including the reconstitution of the critique of political economy. However, as a preliminary assumption it makes sense to view both the neo-classical synthesis and the Marxism of the Second and Third Internationals, as, on the whole, attempts to conceptualize a successful, secure, and expansive capitalist world system. Baran and Sweezy represent a transitional tendency in this perspective. With the passing of this period of capitalist success, whose existence, it must be admitted, was neither foreseen nor expected by either Marx or Ricardo, it makes sense to look once again at the period before the onset of what Marx termed 'vulgar economy.'⁴

In short, the period of vulgar economy had a 100-to 150-year existence, coinciding with the period in which the capitalist mode of production was established and secure. Vulgar economy produced elegant formulations and justifications for the bourgeoisie, and rather defensive and dogmatic ones for the proletariat.⁵ In neither case was the surface of reality penetrated to any significant degree. That the usefulness of these theories has now passed is signalled by the growing search for a new political economy on the part of sectors of the bourgeoisie, and for a new critique of political economy on the part of the left.

The fact that the critique of vulgar bourgeois economy takes the form of neo-Ricardianism poses special problems of Marxism,

problems that are magnified by the relatively advanced and coherent state of current neo-Ricardianism. For it must not be forgotten that Marx's *Capital* was itself a critique of Ricardo, whom Marx treated not as a vulgar economist but as the highest representative of classical political economy. Both neo-Ricardianism and Marxism are opposed to vulgar economics as it has developed over the past 150 years. That is their unity. However, in as much as they are each opposed to the other, as Marx was to Ricardo, the line between them must be clearly drawn. Not to do so would be to treat Marx as simply another representative of classical political economy, which is, in fact, precisely the tack that both the neo-Ricardians and the vulgar bourgeois economists take.⁶

One of the aims of this paper is to discuss systematically the differences between Marxism, on the one hand, and vulgar economy, both bourgeois and Marxist, and neo-Ricardianism, on the other hand. Although clarifying differences is important for its own sake, it is also a contribution to a more important task—developing revolutionary theory. What is needed, at bottom, is an adequate conception of the object of Marx's *Capital*, that is, of the economy in the capitalist mode of production. The most promising framework within which to do this is that suggested by Althusser and developed by him and his coworkers. In this framework the capitalist mode of production is conceived of as a structural combination of its economic, political, and ideological levels or regions (the number of these levels is subject to modification and deepening), the structure as a whole being determined in the last instance by the economic, and maintaining itself through a process of reproduction. Further, the levels themselves are structures in dominance. In particular, the economic structure is a combination of production, circulation, consumption, etc., the level of production being dominant.⁷

The specific differences between Marxism and the various other trends discussed above are located concretely in the different ways that they conceptualize the articulation between circulation and production, circulation being the form taken by distribution in the capitalist mode of production. Articulation refers to the precise connection between two levels or structures. Its specification is a specification of the type of complex unity exhibited by the total structure of which the structures in question are levels. Thus, to specify the articulation between production and circulation means to construct the complex unity of the economic level, which is the object of *Capital*.⁸ That this is the place in which basic differences are located is not at all surprising. The fundamental aspect of any theory of the economic level is its conception of the constitution of that level—that is, the object of the theory. Theories will naturally

differ most radically on exactly this point, while at other levels differences can be masked by ideological and superficial similarities of terminology that obscure the difference in their object.

The category that links production and circulation is 'value'. It is, at the same time, the simplest and most difficult of Marxist concepts. The second section of this paper is devoted to developing the nature of value and exposing certain misconceptions of it. In particular, in the first part of this section I outline how value provides the articulation of production and circulation. The concrete form this articulation takes is known as the 'transformation problem'. Section III is a detailed study of this somewhat obscure, but in this context crucial, aspect of Marx's theory.

This understanding of the place of the transformation problem is not conventional. Even though it has been the center of a running controversy between Marxists, on the one hand, and neo-Ricardians and vulgar economists, on the other hand, that has flared up and died down several times in the past 75 years, the transformation problem has never been seen as a problem of developing the categories that link production and circulation, and so as fundamental in constructing the object of political economy. Thus the aims of this paper are three-fold: in the first place, to enter the debate between the various theoretical tendencies; to do this by, in the second place, clarifying the different nature of their objects at the level of their conceptions of the economic structure; and finally, to concretize this conception by interpreting the transformation problem as the bridge between production and circulation, and presenting a detailed discussion of the Marxist solution to it, a solution that can be obtained, it should be noted, only in the context of this interpretation.

II Marx's theory of value

Although it is conventional to use the phrases 'labor theory of value' and 'Marx's theory of value' as if they were interchangeable, this formulation involves errors that inevitably push Marxism toward vulgar economy and Ricardianism. In the first place, it implies that there was a 'labor theory of value' before Marx. While it is true that the classical political economists often seem to be struggling toward such a theory, and that they use parts of it, albeit inconsistently, it is also true that none of them was able to formulate a consistent and coherent labor theory of value meant to apply to the capitalist mode of production.⁹

Adam Smith's discussion of the labor theory of value was limited to a (mythical) precapitalist period in which everyone owned their own tools and exchanged their products on the

market. 'In that early and rude state of society which precedes both the accumulation of stock and the appropriation of land, the proportion between the quantities of labor necessary for acquiring different objects seems to be the only circumstance which can afford any rule for exchanging them for one another.' (Smith, 1965: 46) However, as Paul Samuelson is only too happy to point out, 'Adam Smith lingered in his "early and rude state" with its undiluted labor theory for only a page. Turn the page and Eden is left behind.' (Samuelson, 1971: 404) Smith then enters a world in which 'stock has accumulated in the hands of particular persons.' (Smith, 1973: 48) In this capitalist world the labor theory of value as he originally formulated it no longer holds and Smith abandons it completely. In any event, it was not a theory of value in the first place but a theory of exchange ratios; and Smith substitutes for it a factor theory of exchange ratios in which prices are *composed* of wages plus profits plus rent. One of the purposes of Marx's own analysis was to lay bare the ideological basis of this factor theory to which he referred sarcastically as the 'trinity formula.'¹⁰

Ricardo attempted to maintain Smith's labor theory of exchange in the presence of capital. He did this by making the obvious observation that, 'Not only the labor applied immediately to commodities affects their value, but the labor also which is bestowed on the implements, tools, and buildings, with which such labor is assisted.' (Ricardo, 1965: 13) This emendation by Ricardo is correct. However, as he himself notes, *it refers to the means of production simply as physical objects and not as capital*; that is, the fact that the means of production are owned by Smith's 'particular persons' is irrelevant to Ricardo's value theory (though not, of course, to his distribution theory, which is thus separated from his value theory).¹¹ This conceptual separation of value and distribution, based on an understanding of the means of production as simply physical objects, remains the central feature of contemporary neo-Ricardianism.

Now it is true that Marx carried this theory further, to a consistent conclusion, by taking into account the fact that means of production are always capital in the capitalist mode of production. He did this in his solution to the problem of the formation of the general rate of profit; this is, by his introduction of the transformation problem. However, to see only this aspect of Marx's theory is to make it merely a continuation of classical political economy and Marx the last of the classical political economists. In fact, Marx completely reoriented the object of inquiry. The distinction between the 'labor theory of value' the development of which has just been outlined, and 'Marx's theory of value', lies at the level of the conception of the nature of value.

It is this distinction that enabled Marx to break with the object of classical political economy and so validates his work as a critique of political economy, rather than as ‘Marxist’ political economy.¹²

For Ricardo there is nothing problematic about the labor that creates the value of commodities. It is labor—nothing more need be said. But for Marx,

As regards value in general, it is the weak point of the classical school of Political Economy that it nowhere, expressly and with full consciousness, distinguishes between labor, as it appears in the value of a product and the same labor, as it appears in the use-value of that product. (Marx, n.d.: 84n)

That is, *the value of a commodity is not to be identified with the concrete labor that produces the commodity*, for example, the labor of soldering, or welding, or printing, or assembling, or any of the hundred-thousand other useful activities that produce or contribute to the production of commodities. This concrete labor ‘appears in the use-value’ of the commodity.

If value is not created by concrete labor, which was the conception of all of the classical political economists when they thought about it at all, then what labor does create it? Marx terms the value-creating aspect of labor *abstract labor*, and emphasizes that it has a purely social reality,

. . . all are reduced to one and the same sort of labor, human labor in the abstract . . . When looked at as crystals of this social substance, common to them all, they are—Values. (Marx, n.d.: 46)

This distinction between concrete labor and abstract labor leads Marx to his critique,

[Political Economy] has never once asked the question why labor is represented by the value of its product and labor-time by the magnitude of that value. (Marx, n.d.: 85)

The reason that Political Economy did not ask this question is that it could not conceive it. Seeing only concrete labor, and identifying it with value, makes value a natural rather than a social category. Only the understanding that value is created by abstract labor allows one to ask why abstract labor exists. And only this question allows the historical query: What is the origin of abstract labor and what is its future?

Marx emphasized the importance of his notion of the two-fold character of labor. He wrote to Engels in 1867 that,

. . . the best points in my book are: 1) *the two-fold character of*

labor, according to whether it is expressed in use-value or exchange-value. (*All understanding of the facts depends upon this.*) It is emphasized immediately, in the *first* chapter . . . (Marx and Engels, 1965: 192)

Indeed, the title of the second Section of Chapter I of *Capital*, Vol I is, 'The Two-Fold Character of Labor Embodied in Commodities.'

Now it is very easy to understand concrete labor. We see it around us and perform it ourselves every day. However, abstract labor is a much more difficult concept.

Turn and examine a single commodity, by itself, as we will, yet in so far as it remains an object of value, it seems impossible to grasp it. If, however, we bear in mind that the value of commodities has a purely social reality, and that they acquire this reality only in so far as they are expressions or embodiments of one identical social substance, viz., human labor, it follows as a matter of course, that value can only manifest itself in the social relation of commodity to commodity. (Marx, n.d.: 54)

The points made in this passage are essential to understanding Marx's value theory. The most important one is that *it is precisely the social nature of abstract labor that makes it invisible in the process of production, which in the capitalist mode of production takes the form of an individual activity*, for the process of commodity production is not *directly* social. Thus, while concrete labor can be seen directly, abstract labor appears only in its effects. 'The progress of our investigation will show that exchange-value is the only form in which the value of commodities can manifest itself or be expressed.' (Marx, n.d.: 46) This is, as Marx indicated, the key to 'all understanding of the facts.'

An immediate consequence of the peculiar nature of abstract labor is that while Marx's theory of value is a theory of price *formation*, it is not directly a theory of prices. Ricardo's theory of value, on the other hand, is a theory of price because he identifies abstract labor and concrete labor. Here the substance of value can be measured in the process of production, and thus relative prices can be determined directly. Paradoxically, in this way Ricardo loses the concept of value completely. His is a labor theory of price and not a labor theory of value.¹³

The reason that Marx's theory of value is not a theory of price is that *there is no way to reduce observable concrete labor to social abstract labor in advance, outside of the market which actually effects the reduction*. This observation is the central

feature of Marx's concept of value. The reduction of concrete labor to abstract labor in the market is prior to the problems involved in the determination of socially necessary labor time and in the reduction of skilled labor to simple labor. Even assuming that a worker is working at socially average productivity, the reduction of concrete labor to abstract labor must still be made, and can only be made, in the market. This may account for Marx's apparently cavalier treatment of the reduction of skilled labor to simple labor, which has disturbed many readers of *Capital*, Vol I. The translation from a particular concrete labor to abstract labor must take place in any event. No mechanical rules can be given in advance for making this reduction. In fact, this reduction is the basic element in the articulation of production and circulation. Of course, when the process of reproduction runs smoothly certain relationships become crystallized and producers can take the value of their product into account before the action of the market takes place. The reduction from skilled labor to simple labor is merely a further part of this process, and Marx was justified in treating it as he did, commenting, 'Experience shows that this reduction is constantly being made.' (Marx, n.d.: 51)

The statement that Marx's theory of value is not a theory of price may be construed in two ways—one weak and the other strong. The weak sense would be that value theory can predict prices, but that Marx was not (and by implication Marxists should not be) interested in this aspect of the problem. The strong sense is that *in principle* Marx's theory of value cannot be used to obtain prices. It is this strong version of the statement that is the case. Knowing that the substance of value is abstract labor does not help, for abstract labor can be *observed* in only one place—the market—where its palpable reality takes the form of money. As Marx says, 'Value, therefore, does not stalk about with a label describing what it is [i.e., abstract labor—I.G.]' (Marx, n.d.: 79) Abstract labor as such can be 'measured' only when it takes the independent form of money, a form that poses it against the bodily form of the commodity in which it is embodied.

However, it will not do to separate the qualitative and quantitative aspects of Marx's theory too sharply.¹⁴ While abstract labor cannot be observed in the process of production where it is actually expended, appearing (in another form) only in exchange, it is not merely a mental construct. It has a social nature and so has a social reality;

The fact that the specific kind of labor is irrelevant presupposes a highly developed complex of actually existing kinds of labor, none of which is any more the all-important one . . . The fact

that the particular kind of labor employed is immaterial is appropriate to a form of society in which individuals easily pass from one type of labor to another, the particular type of labor being accidental to them and therefore irrelevant. Labor, not only as a category but in reality, has become a means to create wealth in general, and has ceased to be tied as an attribute to a particular individual. This state of affairs is most pronounced in the United States, the most modern form of bourgeois society. The abstract category 'labor,' 'labor as such,' labor *sans phrase*, the point of departure of modern economics, thus becomes a practical fact only there. (Marx, 1972: 210).¹⁵

The precise connections between this social reality of abstract labor and the quantitative aspect of Marx's theory are, however, not specified clearly and remain a problem in his work. A remark made by Sowell in his book on the classical political economists may be pertinent here. He distinguishes between two types of theories, those which explain *states of being*, and those which explain *changes*. For the classical political economists, and for Marx as well, the task of theory was understood to be the latter, that is, to explain changes. For example:

In terms of the Marxian theory of history, economics might explain very little of why families exist—instead of there being a wholly atomistic society or one in which people clustered in ways unrelated to biological kinship—and yet explain very much of why families have changed in the way they have from one century to another. (Sowell, 1974: 129)

Thus, a major problem for Ricardo was to understand the effect that changes in wages would have on profits and prices. Marx was concerned with, among other things, the effect of changes in the productivity of labor on the rate of profit and accumulation. And, of course, Marx was interested in the development of abstract labor. Although concrete labor cannot be identified with abstract labor, Marx generally restricts himself to talking about changes in the parameters of concrete labor. Changes in the length of the working day, in the total work force, and in the intensity of labor, although they refer directly to the description of concrete labor are presumably correlated with changes in the magnitude of abstract labor expended. On the other hand, a change in labor productivity alone, that is, an increase in produced use-value with no change in concrete labor, does not change the magnitude of expended abstract labor. In this way Marx's theory finds its quantitative dimension.

These remarks are only preliminary. *Capital* must be read carefully with the above principle in mind. However, I believe it is

safe to say that the useful quantitative results stemming from Marx's critique of political economy will apply to the explanation of changes and the effects of changes. This program is hindered to some extent by Marx's vocabulary which does not always reflect this emphasis consistently.¹⁶ Nevertheless, Marx's approach is inherently dynamic and has little in common with the static equilibrium models that underly both vulgar economy and neo-Ricardianism. Still, it is important for Marxists to recognize that the quantitative connections have not yet been made in a completely satisfactory way. Much work remains to be done in this area.

To return to the main thread of the discussion, let us look more closely at the reason behind the fact that abstract labor cannot be observed in the process of production. The capitalist mode of production, as a commodity mode of production, is characterized by the fact that production is an independent activity of individual producers who produce products for the purpose of selling them in the market. Considered in its productive aspect alone, such a mode of production does not *appear* to be social. Indeed, in a sense it is not social because no social relationships are established between the producers in the process of production. It is only when products are brought to the market that actual social relationships are established between the producers. It is for this reason that abstract labor, which has a purely social reality, is not observable in the *isolated* act of production (despite the fact that it is expended and value is created there), appearing only in the process of exchange and circulation in which the actual social connections are made. Marx says this, in fact, quite explicitly. It is hard to see how he could be misunderstood:

As a general rule, articles of utility become commodities, only because they are products of the labor of private individuals or groups of individuals who carry on their work independently of each other. The sum total of the labor of all these private individuals forms the aggregate labor of society. Since the producers do not come into social contact with each other until they exchange their products, the specific social character of each producer's labor does not show itself except in the act of exchange. In other words, the labor of the individual asserts itself as a part of the labor of society, only by means of the relations which the act of exchange establishes directly between the products, and indirectly, through them, between the producers. (Marx, n.d.: 77-78)

This brings us right to the heart of Marx's theory of value. At issue is the general relationship between production and distribution, and the form that relationship takes in the capitalist mode of production. As to the former, Marx wrote,

A distinct mode of production thus determines the specific mode of consumption, distribution, exchange and the *specific relations of these different phases to one another*. Production in the narrow sense, however, is in its turn also determined by the other aspects. (Marx, 1972: 205)

In other words, 'production is the decisive phase,' (Marx, 1972: 204) in a structure in which the other levels, distribution and consumption, have relative autonomy and exercise their own determinations. To move beyond these general observations, the articulation of these phases in a specific mode of production must be constructed. In this process of articulation categories established at one level of analysis are 'transformed' into new categories, or at least given new meanings. (See, for example, Althusser and Balibar, 1970: 223, 268) In fact, this is precisely the significance of the 'transformation problem.' It is a member of a much larger category, the transformation of meanings and categories attendant upon the increasingly complete specification of a structure. In this case the structure is the economic level of the capitalist mode of production, the category is value, and the specification corresponds to considering distribution (circulation, exchange) in a complex unity with, and dominated by, production.

The unique feature of the articulation of production and circulation in the capitalist mode of production has already been brought out above. It is that despite the fact that production is dominant (as in any mode of production), circulation establishes the social connections between the agents of production. This paradoxical situation gives rise to a series of effects summed up in the concept of commodity fetishism and the observation that everything appears inverted in competition. *The major inversion is taking circulation as the dominant level because it is the most accessible and apparently distinguishing level of the capitalist mode of production.* This is the root source of commodity fetishism and of most incorrect understandings of the nature of value. It is evident that this error is inherent in the structure of the capitalist mode of production and is not simply 'a mistake'. It was to avoid this problem that Marx introduced the, at first apparently meaningless, distinction between value and exchange-value. Value is the social category produced in the process of production; its form of appearance in exchange is exchange-value.

Marx begins *Capital* with 'A Critical Analysis of Capitalist Production,' (the subtitle of Volume 1). He starts this way because production is always the dominant aspect of the economic region. Thus its structure must be established first. Circulation, however, is present implicitly in its effects even at this stage of the analysis. The

implicit presence of non-dominant structures in the analysis of dominant structures, even before the non-dominant structure is analyzed (or can be analyzed), is characteristic of structural combination, and distinguishes it from model building. In the case of the combination of production and circulation in the capitalist mode of production this characteristic has special salience. Value could not even be talked about if the forms of its appearance were not specified. Even more, the social nature of value demands that circulation be present implicitly at the point of its creation in the individual act of commodity production. As was the case for abstract labor, this is not merely a theoretical construct but corresponds to social reality in commodity modes of production. The producer must take into account the probable result of exchange, even in the act of production. Thus commodities can be produced only after exchange has become sufficiently generalized,

This division of a product into a useful thing and a value becomes practically important, only when exchange has acquired such an extension that useful articles are produced for the purpose of being exchanged, and their character as values has therefore to be taken into account, beforehand, during production. From this moment the labor of the individual producer acquires socially a two-fold character. (Marx, n.d.: 78)

It is this structure, the dominance of production requiring that it be the focus of the first part of the investigation, the absence yet implicit presence of circulation at this stage, in a situation in which the nondominant aspect, circulation, provides the linkages that realize the social nature of production, that creates the major barrier to an adequate conceptualization of the capitalist mode of production. If this conceptualization were to be schematized in terms of Marx's *Capital* the result would be as follows. In Volume I production alone is considered, with, however, the qualification that circulation is present implicitly in its specific effects (i.e. value). Volume II considers circulation itself. Volume III is not simply the addition of production and circulation, but is the construction of their unity as an articulated complex structure. The difference between the two points of view is that in the second key categories of production are changed (transformed) between Volumes I and III. For the remainder of this paper references to Volume III, or simply to circulation, always refer to the unity of production and circulation in this sense. (For a detailed exposition of the articulations of *Capital* see Establet, 1973)

A major difference between Marxism, neo-Ricardianism, and vulgar Marxism is located in their different conceptions of the articulation of production and circulation. Marxism maintains the

relationship outlined above. Both neo-Ricardianism and vulgar Marxism separate the two realms. Neo-Ricardians take a simple unity of production plus circulation to be a correct description of the economic level. Specifically, they view production as a natural phenomenon, and put the total content of social relationships, rather than simply their establishment, into circulation. As the theoretical basis of reform movements neo-Ricardianism leads only to considerations of distributive justice, leaving production relationships unchanged. Thus it supports various types of reformist positions that do not question the underlying basis of capitalism as a mode of production.

Vulgar Marxists, on the other hand, make the opposite mistake. Vulgar Marxism fetishizes production *per se*, and views circulation as a mere epiphenomenon of it. *Thus the dominant instance is mistaken for the entire structure.* Vulgar Marxism may be revolutionary in intent, but lacks an adequate theoretical underpinning for these intentions. It does not comprehend the nature of social relationships because it cuts itself off from the sphere in which they are realized. Ultimately then, this tendency, too, inevitably leads in a reformist direction because it cannot take effective action to realize its own goals.

Value links production and circulation in the capitalist mode of production. It is produced in the process of production but appears in circulation. Since it is the transformation problem that makes the linkage explicit by transforming the category of value from its meaning at the level of production alone to its meaning at the level of the unity of production and circulation, the differences between Marxism, vulgar Marxism, and neo-Ricardianism are epitomized in their different approaches to the transformation problem. Neo-Ricardians focus on it, only to sever production from social relationships entirely by constructing a simple unity in which production is understood technically and the transformation problem itself is treated simply as a problem of mathematical economics. They interpret the necessity of transformation as a rejection of the dominance of production relations in the structure of the economic level, by treating the transformation as being one from an inadequate *model* of economic reality in which circulation categories are ignored to a more realistic one in which they are dominant. Vulgar Marxism, on the other hand, tends to ignore the transformation problem completely, preferring to remain at the safe level of Volume I. The confrontation between neo-Ricardianism and vulgar Marxism is thus, not surprisingly, a sterile one. It is between two incorrect conceptions of the construction of the unity of production and circulation, and so cannot be resolved.¹⁷

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If one error, common to neo-Ricardianism and vulgar Marxism, is to treat value as observable in production, and the theory of value as a theory of price, thus confusing production and circulation, then a second error, again common to both tendencies (and again with a characteristic difference) is to treat the theory of value as mainly a proof of capitalist exploitation. In the concept of surplus value the emphasis is placed upon the adjective—*surplus* value.

The neo-Ricardians make this connection via Ricardo's proof, updated by Sraffa (1960), that total profits and total wages vary inversely. This is taken to be the total content of the theory of surplus value. The point is not to deny the validity of the Ricardian theorem under the conditions for which it has been proven. However, as we shall see, it does not come close to exhausting the content of Marx's use of notion of surplus value.¹⁸

Vulgar Marxism, too, takes the theory of surplus value to be a proof of capitalist exploitation. However, the different stances taken by vulgar Marxism and neo-Ricardianism of the relationship between production and circulation lead to different (mis)understandings of the nature of the exploitation. The neo-Ricardian emphasis on circulation results in the use of exchange categories to describe exploitation. Thus they emphasize the inverse relationship between profits and wages rather than the connection between surplus value and the value of labor power. Vulgar Marxism remains at the level of abstract production. It sees only the relationship between individual capitalists and individual workers since the social phenomena built up in the process of circulation remain unavailable to it. This emphasis seriously undercuts the desire to build up a class description of social events. In particular, by focusing on that aspect of exploitation which occurs at the level of individual capitalist versus individual worker (or factory-wide collective worker) it cannot explain such basic structures as, for example, the state, imperialism, fascism, all of which require an understanding of the capitalist mode of production as a whole. In addition, and for the same reasons, by remaining at the abstract level of production in itself, it is impossible to construct a scientific theory of consumption or ideology, which is clearly necessary if a strategic perspective for the advanced countries is to be developed.

The exploitation argument is sometimes taken a step further. Not only is the theory of value seen as a theory of exploitation, it is combined with the notion of 'natural right' and expanded into the moral demand that the laborer (or, more generally, labor) receive the full product of his (its) labor. The roots of this idea are located in Locke's notion of the right to property flowing from labor. Thus it is

basically a bourgeois conception. The so-called Ricardian socialists of the early 19th century attempted to turn it against the bourgeoisie but could only do so in the interest of another property-owning class, petit-bourgeois artisans.¹⁹

Marx was particularly opposed to the appearance of these ideas within the working-class movement. When commenting on the draft program of the German Workers' Party, the Gotha Program, which opened with the statement,

Labor is the source of all wealth and all culture, and since useful labor is possible only in society and through society, the proceedings of labor belong undiminished with equal right to all members of society

he responded with two arguments. First,

Labor is *not the source* of all wealth. *Nature* is just as much the source of use values (and it is surely of such that material wealth consists!) as labor . . . (Marx and Engels, 1968: 319)

The reference to use value alludes to the dual nature of the commodity. Although it is the sole source of *value*, labor is not the sole source of *use value*. The formulation of the Gotha Program confuses the two. Thus it cannot be the basis for an attack on surplus *value*. It leads, rather, to demands for a more equitable distribution of the product. This formulation mounts no challenge to the capitalist mode of production.

In the second place, Marx writes,

The bourgeoisie have very good grounds for falsely ascribing *supernatural creative power* to labor; since precisely from the fact that labor depends on nature it follows that the man who possesses no other property than his labor must, in all conditions of society and culture, be the slave of other men who have made themselves the owners of the material conditions of labor (Marx and Engels, 1968: 319)

That is, an emphasis on labor as the only productive (of use value) factor leaves out means of production, whose private ownership is characteristic of the capitalist mode of production. These considerations explain the neo-Ricardian predilection to treat constant capital as past (dated) labor. (See, for example, Bortkiewicz, 1952; Sraffa, 1960; Steedman, 1972)

The interpretations of Marx's theory of value that have just been discussed, a theory of price, on the one hand, or a theory of

exploitation, on the other hand, barely scratch the surface of the content he attributed to it. Marx was not interested in how capitalism worked for its own sake, but wanted 'to lay bare the economic law of motion of modern society . . .' (Marx, n.d.: 20) The notion of value lies at the heart of this project, for Marx attributed centrality to the *form* and not simply the *fact* of exploitation:

The specific economic form, in which unpaid surplus-labor is pumped out of direct producers, determines the relationship of rulers and ruled, as it grows out of production itself and, in turn, reacts upon it as a determining element. Upon this, however, is founded the entire formation of the economic community which grows up out of the production relations themselves, thereby simultaneously its specific political form. It is always the direct relationship of the owners of the conditions of production to the direct producers—a relation always naturally corresponding to a definite stage in the development of the methods of labor and thereby its social productivity—which reveals the innermost secret, the hidden basis of the entire social structure, and with it the political form of the relation of sovereignty and dependence, in short, the corresponding specific form of the state. This does not prevent the same economic basis—the same from the standpoint of its main conditions—due to innumerable empirical circumstances, natural environment, racial relations, external historical influences, etc., from showing infinite variations and gradations in appearance, which can be ascertained only by analysis of the empirically given circumstances. (Marx, 1971a: 791-92)

I have cited this passage at length because it is one of the clearest general indications of the content of Marx's theory of history, that is, the science of historical materialism.²⁰ It fills out and modifies the sketch given in the well-known 1859 Preface in which Marx wrote less specifically of the 'relations of production [constituting] the economic structure of society, the real foundation, on which arises a legal and political super-structure and to which correspond definite forms of social consciousness.' (Marx, 1972: 20) The somewhat open notion of 'relations of production' in the Preface is thus specified in *Capital* to consist, at least in part, of the 'specific economic form in which unpaid surplus-labor is pumped out of direct producers.'

Marx specified the content of the concept of 'relations of production' further:

Whatever the social form of production, laborer and means of production always remain factors of it. But in a state of separation

from each other either of these factors can be such only potentially. For production to go on at all they must unite. The specific manner in which this union is accomplished distinguishes the different economic epochs of the structure of society from one another. (Marx, 1967: 36)

This passage appears in the context of a discussion of the conditions for the generalization of commodity production. Marx thus linked this generalization (a market or circulation phenomenon) to a particular change in the relationships of production, namely the complete transformation of labor power into a commodity and hence the introduction of a new category, the *value* of labor power. (For a detailed discussion of this point see Althusser and Balibar, 1970)

Marx's use of the category of value is thus unique. He conceived of it as the central category with which to unravel the law of motion of the capitalist mode of production. Fundamental to this project is the category of surplus value where the emphasis is placed on the noun—surplus *value*, for this is the form in which the surplus is pumped out of the direct producers in the capitalist mode of production. In order that this form be dominant it is necessary that labor power itself become a commodity, that is, have a value. Thus the concept of value properly understood is the most central expression of the relations of production specifically characteristic of the capitalist mode of production.

Marx's own results using this scheme were many; this is not the place to analyze them in detail. They range from the prediction of the progressive centralization and concentration of capital, to the homogenization of labor, to the crisis-prone character of capitalism, to the falling rate of profit, and, of course, to a theory of the growth of consciousness and the origin of revolutionary change. Some of these have been borne out historically, others may be partial. It remains true, however, that if we are to remain within Marx's analytical framework, value is the category that must be the basis of study of the laws of development of the capitalist mode of production.

As argued above, such an analysis cannot stop with the conception of value obtained from Volume I of *Capital*. The correct links between production and circulation must be grasped in order to develop the category of value to the point where it can play the central role ascribed to it. At the same time, of course, the articulation of the capitalist mode of production will be clarified, since developing the laws of motion of a mode of production takes place through an understanding of its complex structured existence. Thus the two roles of value turn out to be the same. Value is the

category that links production and circulation, while it is, at the same time, the form in which the surplus is pumped out of direct producers.

From this point of view the transformation problem is hardly a formal mathematical exercise of little intrinsic interest, as the neo-Ricardians would have it; rather, it moves to center stage. (May, 1949, 67; Robinson, 1950: 361) A correct understanding of the transformation problem is necessary (although only a first step) in reconstructing Marxist theory after 100 years of its subordination to bourgeois ideology.

III The Transformation Problem

i The 'Contradiction'

In simplest terms the transformation problem arises from the fact that while in Volume I Marx treats commodities as if they exchange at prices equal to their exchange values, it turns out that this is incompatible with the formation of a general rate of profit.²¹ The argument is as follows:

The value of any commodity has a structure. In the first place, there is the new value created by the expenditure of the labor that is socially necessary to produce the commodity. A certain number of workers work a certain amount of time in the process of production. Their concrete labor produces the use value of the commodity while the abstract labor expended is the substance of the newly created value, whose magnitude is the amount of abstract labor expended. This would be all there was to it if it were not for the existence and use of means of production: tools, raw materials, machinery, fuel, buildings, etc., which were themselves produced as commodities and so are values. If the process of producing the final commodity is thought of as an extended one, in which the means of production are themselves produced as intermediate steps, then the labor time socially necessary to produce them (i.e., their value) is seen to be labor time expended upon the production of the final commodity. Thus the value of the means of production is simply transferred to the final product, either all at once if the item is completely used up, or piece by piece if, as for example is the case with a machine, the item is used up only after several production cycles. This latter situation is referred to as fixed capital.

The value of any commodity then is composed of two parts. One part is the *preserved and transferred* value of the means of production; its magnitude is fixed by the value of the means of production and has nothing to do with the process of producing the new commodity (assuming that the machines, etc. have been used

'properly'). Value from this source is *transferred* from the means of production to the final product. For this reason Marx refers to the means of production as constant capital. New value is not created here; the sum of value before and after the production process has taken place is the same. Only the location of this value has changed. Before the production process, it is in the form of means of production; afterwards, in the form of the final product.

The second part of the value of the product is the new value created by the direct labor of production. The total of this value produced in a single working day clearly varies directly with the length of the working day. It also varies with the intensity of labor, and considered in its social totality, with the number of employed workers. For these reasons Marx describes this part of the value as the product of variable capital; that is, labor power is variable capital when it is purchased by a capitalist for use in capitalist production. In terms of the distinction between concrete labor and abstract labor, that is the dual nature of labor, abstract labor is the substance of the newly created value, while concrete labor preserves and transfers the value of the means of production. Of course these are not two separate processes, but are aspects of a single labor process.

The newly created value too has a structure. For capitalist production does not use simply labor, but wage labor. That is, labor power is a commodity whose value, like that of any other commodity, is the amount of abstract social labor necessary to produce it.²² Now the value of labor power, the time necessary to 'produce' the laborer (or, more accurately, reproduce the labor force—recall the social nature of value), bears not immediate quantitative relationship to the value created by that laborer in the process of production. This value is determined by the length of the working day, the intensity of labor, and the conversion of a particular concrete labor to abstract labor. Thus the newly created value itself has two parts. The first part is equal to the value of labor power, and replaces it in the product. The second part is the remainder. It accrues to the capitalist as surplus value.

Putting these considerations together, the value, w , of any commodity can be written in the following form:

$$w = c + v + s \tag{1}$$

where

c = the transferred value of the constant capital;

v = the value of labor power;

s = the surplus value.

Of course, $(v + s)$ is the newly created value and $(c + v)$ is the capitalist's advanced capital, the money laid out to start production. The value w may be thought of as the value of a single unit of a particular commodity or of several units.

Marx assumes that, in general, the ratio s/v , which he calls the rate of exploitation or the rate of surplus value, is the same for all workers. The argument is as follows. The value of labor power is the same for all workers because it is the abstract labor time needed to produce those commodities needed to reproduce the laborer. By definition of the social nature of value this does not vary from worker to worker.²³ On the other hand, s is the difference between this value and the length of the working day, at given intensity, assuming that the reduction from concrete to abstract labor is the same for all workers. Now, since work has neither meaning nor dignity under capitalism, despite the attempts of bourgeois ideology to convince people otherwise, perfectly 'free' wage labor will search for the shortest working day with lowest intensity. Furthermore, this is not merely a passive search but is part of the content of the class struggle at the economic level, which, for example, establishes a 'normal' (i.e. fixed and uniform) working day. Under these conditions all workers produce the same amount of surplus value, and so the rate of exploitation is uniform. Perhaps it would be more accurate to assert that there is a *tendency* in the capitalist mode of production toward equalization of the rate of exploitation.²⁴

Now this tendency appears to be incompatible with another tendency of the capitalist mode of production, that of the equalization of the rate of profit. The essence of the capitalist mode of production is capital's search for profit. No capital can be satisfied unless it produces the highest profit possible, and on this basis capitalist competition takes place. This competition is not limited to intrabranched competition between producers of identical or substitutable products, but proceeds across branch lines. It is competition not for the consumer's dollar but for the highest profit rate. The result of this general competition is an equalization of the rate of profit—all capitals receiving the same rate of profit—and so establishing the general rate of profit, which as with all market phenomena must be thought of as the center of innumerable fluctuations.²⁵

The conflict is as follows. The capitalist, according to the analysis expressed in Eq. (1) obtains an amount of value over and above his advances of $(c + v)$ equal to s . Since prices have been assumed to equal exchange value these quantities may equally well be thought of as amounts of money. Then s is the capitalist's profit, $(c + v)$ his capital outlay.²⁶ The rate of profit, r , is then given by the ratio of profit to investment

$$r = s/(c + v) \quad (2)$$

Rearranging the terms of this equation gives,

$$r = \frac{s/v}{1 + c/v} \quad (3)$$

Since the rate of exploitation, s/v , is the same for all workers independent of industry, it follows that r will be uniform only if c/v , the ratio of constant capital to variable capital, is the same for all industries. But c/v is the value measure of the amount of means of production per worker. There is no reason to expect it to be invariant to the type of production. The chemical industry, for example, uses far more complex and costly machinery and far fewer workers proportionately than does, say, the textile industry.²⁷ The conclusion is inescapable that there is a conflict between an analysis based on Marx's theory of value and a characteristic feature of the capitalist mode of production, the formation of a general rate of profit.

There is a less technical and perhaps more illuminating way of arriving at this conclusion. Surplus value arises from new labor and not from the means of production whose value is preserved and transferred to the final product without undergoing any change in magnitude. But this is seemingly in contradiction with everyday capitalist reality. It would appear to be to the capitalist's advantage to increase his labor force, the source of surplus value, relative to his means of production. In fact, exactly the opposite takes place. The tendency of capitalism is to increase the means of production relative to living labor, which is thus in contradiction to 'rational' behavior according to the law of value. To the capitalist it appears as if profit springs from total capital, rather than from living labor.²⁸ It is this observation, in fact, that gives plausibility to factor theories that ascribe productive power to capital, as opposed to the labor theory of value which denies that capital can create new value except in its form of variable capital. Factor theories thus take the point of view of the individual capitalist, which explains the fundamental role played by the notion of the 'firm' in neoclassical theory.

ii Marx's Solution

Smith and Ricardo effectively gave up in the face of this contradiction. Smith abandoned the labor theory of value, and Ricardo retreated into inconsistencies when faced with problems that touched on the equalization of the rate of profit. Marx's solution to what, in fact, is only an apparent contradiction, is based on his understanding of the relationship of value, production and circulation as discussed in Section II above. The value theory on which the above discussion has been based is the theory of Volume I, in which production is treated explicitly and in abstract isolation. Circulation is treated only implicitly to the extent that production, even in abstraction, requires concepts of circulation and exchange. Production of commodities, considered abstractly in this sense, does

not allow any differentiation between capitals on the basis of the use values of their products, because use value is relevant only in exchange. What concerns the capitalist as an abstract producer is that his commodity be a use value for some purchaser (this is the implicit appearance of exchange). The particular use value is important only to the purchaser. Thus the process of capitalist production, abstracted from circulation, is a process of value production alone. Since value is a socially produced substance, the product of any given capital considered at this level can only be thought of as a fraction of the total social capital.

The formation of a general rate of profit depends upon and results from the action of capitalist competition; in other words, on the explicit consideration of circulation and exchange. Thus there is no 'contradiction' between the theory of value and the existence of the general rate of profit, for they are concepts that belong to theoretical constructions of a different order. The theory of value belongs to the level of production, considered in abstraction, and the general rate of profit to the level of the complex unity of production and circulation. *The question then is not how to reconcile the two sides of a contradiction, but how to move or 'transform' from one level of analysis to another.*

The basis for Marx's procedure has been established in the preceding analysis. He argued that the introduction of circulation individuated the capitals that had been considered previously only as fractions of the total social capital, but that it could not affect the total social capital itself. Thus, according to Marx, the total social capital continues to undergo self-expansion, and an analysis at the level of Volume I is correct because circulation cannot add anything at this level. In particular, the formula for the value of a commodity, Eq. (1), continues to hold, but now only for the total social capital.²⁹ If this is the case then the rate of profit for the total social capital is correctly given by,

$$R = S/(C + V) \quad (4)$$

where upper-case letters have been used to refer to total surplus value, total constant capital, and total variable capital, which are assumed to be the sum of the respective individual surplus value, constant capital, and variable capital. That is,

$$W = \sum_i w_i \quad (5a)$$

$$C = \sum_i c_i \quad (5b)$$

$$V = \sum_i v_i \quad (5c)$$

$$S = \sum_i s_i \quad (5d)$$

where the sum runs over all commodities.

Marx identifies R , the rate of profit on the total social capital with r , the general rate of profit as established by competition between capitals. *This identity is, for Marx, the link between production and circulation, and hence, between Volume I and Volume III.* He implements this algorithm by introducing 'prices of production', which are those prices that yield the general rate of profit on the capital advanced. Marx calls the value of this advanced capital its 'cost price'. Denoting the price of production of the i th commodity by w_i , and its cost price by k_i , leads then to the following:

$$k_i = c_i + v_i \quad (6)$$

$$\bar{w}_i = k_i(1 + R) \quad (7)$$

Furthermore, combining Eqs. (6), (7) and (5), the following identities hold:

$$\sum_i \bar{w}_i = \sum_i w_i \quad (8)$$

that is, total price of production is equal to total value;

$$R \sum_i k_i = \sum_i s_i \quad (9)$$

that is, total profit is equal to total surplus value;

$$R = \frac{\sum_i (s_i/k_i)k_i}{C + V} \quad (10)$$

that is, the general rate of profit is the average of the individual (untransformed) rates of profit, weighted by the value of the capital advanced; i.e., it is literally the average rate of profit.³⁰

Yet another ambiguity in terminology (perhaps a reflection of an ambiguity in Marx's conceptual apparatus) must be clarified here. Marx calls the \bar{w}_i *prices* of production and the k_i *cost prices*. However, it is easily seen that they are not prices at all but values. Marx seems to be ignoring the distinction, so carefully made in Volume I, between values and prices when he discusses the transformation problem in Volume III. (Of course it must not be forgotten that Volume III is culled from Marx's notebooks and is not a finished work.) The point is that it is incorrect to think of the transformation as being from value to price, as is so often done (and as we are encouraged to do by Marx's terminology). It is true that the category of price is much more concrete in Volume III than in Volume I, because Volume III deals explicitly with circulation. Nevertheless, value and price are distinct categories, present in *both* volumes. *The transformation from Volume I to Volume III is not a transformation from value to price, but from value and price considered purely from the point of view of production to value and price as modified by circulation and capitalist competition.* The relationship between value and price must be specified at both ends of this chain.³¹ This is the only way to make sense of identities such as Eq. (8). The w_i are values and so the \bar{w}_i must have the dimensions

of abstract labor time. Prices however are ‘the money name of the labor realized in a commodity,’ (Marx, n.d.: 103) and as such cannot be simply equated to value.

Thus prices of production and cost prices are not prices at all but are values (or, at least, exchange values). It is extremely difficult to devise a terminology that (1) reflects these distinctions, (2) does not require long, awkward constructions, and (3) retains some contact with Marx’s usages. Shaikh (1974) and Yaffe (1974) have tried to do this, not with complete success. Yaffe suggests calling the prices that correspond to values at the level of Volume I ‘simple prices’, reserving ‘price of production’ for the prices that correspond to the \bar{w}_i . Shaikh uses the adjective ‘real’ to refer to exchange value. Thus the left hand side of Eq. (9) would be called total real profit. Profit refers to the money expression of real profit. This terminology is adapted to Shaikh’s notion that it is exchange value rather than value that is ‘transformed’. In addition to these suggestions, which I shall follow, I shall refer to the \bar{w}_i as modified values and the k_i as modified cost values, reflecting the view that although the meaning of value is modified when circulation is brought into the picture, it nevertheless remains Marx’s central category. Since profit does not exist at the level of Volume I, Shaikh is correct in holding that it can refer only to circulation categories, that is, to exchange value and price.

iii Class interest and the State

It is helpful to look at the way in which Marx’s transformation procedure resolves the intuitive objection to the simple theory of value, that capitalists do not act as if profit derived exclusively from living labor. In fact, it is now clear that this perception is correct for the individual capitalist. Each capitalist receives a share of the total social surplus value that is proportional to his own capital, both constant and variable. In particular, the number of workers he employs makes no difference. A capitalist whose own workers do not produce ‘enough’ surplus value relative to his constant capital to yield the average rate of profit ‘receives’ surplus value from those capitalists who are in a relative surplus position. Eq. (9) insures that this will work out correctly. (The quotation marks indicate that the description is metaphorical: production and circulation are not separate phenomena.) Thus, from the point of view of his share of the total surplus value, it does not matter to the individual capitalist whether he hires labor or buys machinery. Indeed, machines are less recalcitrant than workers and do not participate actively in the class struggle.

On the other hand, what is true for the individual capitalist is not

true for the capitalist class as a whole. According to Eq. (9), total real profit is equal to total real surplus value, and total surplus value springs solely from surplus labor. The effect of competition forces the capitalist to cheapen his product, which he does by expelling living labor. However, while the individual capitalist happily fires workers and replaces them with machinery, this policy would be suicidal if practiced by the capitalist class as a whole. *The class interest of the capitalist class is not the sum of the interests of the capitalists who make up the class.* Thus the necessity and the nature of transformation have important consequences at the political level. Class interest appears only at the level of the class as a whole, and not at the level of individual members of the class. Thus the formation of the bourgeoisie into a class is not at all a simple matter. The articulation of bourgeois class interest is always problematic since, in any particular case, it may conflict with the interest of all of the members of the class. This is a fundamental problem for the capitalist mode of production at the level of the political superstructure. As Marx put it at the end of a discussion of these points:

Here, then, we have a mathematically precise proof why capitalists form a veritable freemason society vis-à-vis the whole working class, while there is little love lost between them in competition among themselves. (Marx, 1971: 198)

A concrete example of the process of the formation of bourgeois class interest is given in Chapter X of Volume I, 'The Working Day'. Marx first notes that the struggle to define the 'normal' working day is a class struggle between 'collective capital, i.e., the class of capitalists, and collective labor, i.e. the working class'. He examines the brutal effects of the 14 or 16 hour day of the early industrial revolution on the most exploited sectors of the working class, from which it is clear that the working class would struggle and organize itself in favor of a shorter working day. But the degeneration of the working class was not in the interest of the capitalist class either, since capital requires a working class. 'It would seem therefore that the interest of capital itself points in the direction of a normal working day.' However, even in the event that an individual recognized this class interest it would be impossible for him to act upon it. 'But looking at things as a whole, all this does not, indeed, depend on the good or ill will of the individual capitalist. Free competition brings out the inherent laws of capitalist production, in the shape of external coercive laws having power over every individual capitalist.' *The problem is resolved by the state in the form of the Factory Acts.* (Marx, n.d.: 225, 253, 257)

Marx gave two examples of this process. In the first he cited an

1863 petition of 26 Staffordshire potteries (including Wedgwood, a major manufacturer) for 'some legislative enactment' to limit working hours. Marx's analysis: 'Competition with other capitalists permits them no voluntary limitation of working time for children, etc.' He found the second example 'much more striking'. It concerned smaller manufacturers who encouraged their own workers to agitate for legislative enactment of the nine hour system in order to rationalize their own competition with the larger manufacturers. (Marx, n.d.: 275n)

The upshot of this analysis and these examples is that the interests of the capitalist class are not merely expressed through and by the state, rather, they are, to a certain extent, formed by the state; not, of course, out of nothing according to the omnipotent whim of the state, but out of the material basis of those interests located in the process of capitalist production as a whole. *The state is not the tool of the united bourgeoisie, but is the institution that is crucial in creating that unity.*³²

Thus the 'mathematically precise proof' that the class interests of the bourgeoisie are not formed as an aggregate of individual interests has far-reaching consequences. Political assertions about the nature of class, class interests, and the state grow out of this apparently obscure problem in the theory of value (itself frequently regarded as a scholastic question)—the transformation problem. Here is a powerful indication that Marx's concept of value and surplus value as the central categories of the capitalist mode of production is not misplaced. The importance of the transformation problem, in particular, is clear. The damage that an instrumental conception of the state has done to left strategy is incalculable. While it is certainly true that a non-instrumental view of the state does not need to be based on the transformation problem, it is hard to see how else the autonomous character of the bourgeois state can be linked to its determining material base.

iv The Bortkiewicz Critique

Marx's solution to the transformation problem has not lacked critics. Engels published Volume III in 1894. In 1898 Böhm-Bawerk, an Austrian economist, published his well-known attack. (Böhm-Bawerk, 1949) Exhibiting a total lack of understanding of Marx's project and method, he professed to find a great contradiction between Volume I and Volume III. This has, in fact, ever since been the position of vulgar economy. (See, for example, Samuelson, 1970, 1971) It needs no further refutation than has already been provided in Section I and Part ii of this section.³³ Böhm-Bawerk's critique was answered by Hilferding, whose

analysis, however, is not satisfactory, which is hardly surprising in the light of the low level of Marxist understanding developed in the Second International.³⁴ Important to Böhm-Bawerk's 'discovery' of the 'great contradiction' is the assertion that Marx did not know, when he wrote Volume I, that prices could not be proportional to values in a capitalist system with a general rate of profit. This assertion is simply wrong. Internal evidence in Volume I, as well as an explicit solution to the transformation problem contained in a letter to Engels dated 1862, prove conclusively that Marx had developed his solution prior to the publication of Volume I. (Marx and Engels, 1965: 128-31)

Böhm-Bawerk's criticism was actually an attack on the whole of classical political economy from the viewpoint of vulgar economy. Much more interesting and penetrating is the critique (or rather critiques) of Bortkiewicz. (Bortkiewicz, 1949, 1952) Bortkiewicz's criticism turns upon a subtle point in Marx's 'mathematically precise' solution. However, as soon becomes clear, the criticism is really a full-fledged attack on Marx's entire theory in favor of a revival of Ricardo; that is, it removes all elements of the critical aspect of Marx's critique of political economy. The difficulty this raises is that the point made by Bortkiewicz is valid (although his conclusions from it are not) and must be confronted.

This is why Bortkiewicz's critique and alternate solution are at the heart of the contemporary debate between Marxism and neo-Ricardianism.

The technical point raised by Bortkiewicz is as follows. Marx's formula for modified value, Eq. (7), which can be rewritten in the following form,

$$\bar{w}_i = c_i + v_i + R(c_i + v_i) \quad (11)$$

does indeed yield a profit to each capital proportional to its size. But this size is calculated in values rather than in modified values. Bortkiewicz noted that capitalist competition, which is responsible for the equalization of the rate of profit, occurs completely at the level of prices of production, and not half at this level and half at the level of simple prices. The capital which figures into the capitalist's cost price (Marx's term), k_i , should really be valued at modified cost value, \bar{k}_i . In short, Marx transformed the value of the output of the production process but left the input unchanged. Consistency demands that they both be treated as modified values, to which correspond real cost prices, on the one hand, and real prices of production, on the other hand.

No more than in the case of the existence of the transformation problem itself can it be seriously argued that Marx was either unaware of, or rejected, the requirement of the transformation of

inputs. Referring to the fact that in his solution the sum of modified value is equal to the sum of value, Eq. (8), Marx wrote:

This statement seems to conflict with the fact that under capitalist production the elements of productive capital are, as a rule, bought on the market, and for this reason their prices include profit which has already been realized, hence, include the price of production of the respective branch of industry together with the profit contained in it, so that the profit of one branch of industry goes into the cost price of another. But if we place the sum of the cost prices of the commodities of an entire country on one side, and the sum of its surplus values, or profits, on the other, the calculation must evidently be right. (Marx, 1971a: 160)

We may reserve judgement on the validity of the final statement since it is open to mathematical investigation. The main point is that cost value is an input into the formation of cost value. Marx makes an almost identical argument slightly farther on:

We had originally assumed that the cost price of a commodity equalled the *value* of the commodities consumed in its production. But for the buyer the price of production of a specific commodity is its cost price, and may thus pass as cost price into the prices of other commodities. Since the price of production may differ from the value of a commodity, it follows that the cost price of a commodity containing this price of production of another commodity may also stand above or below that portion of its total value derived from the value of the means of production consumed by it. It is necessary to remember this modified significance of the cost price, and to bear in mind that there is always the possibility of an error if the cost price of a commodity in any particular sphere is identified with the value of the means of production consumed by it. (Marx, 1971a: 164–65; see also 161, 206–207)

Given Bortkiewicz's criticism and Marx's own unambiguous remarks, it is hard to maintain that Marx's solution to the transformation problem is correct as it stands in Volume III.³⁵ The main area of controversy centers around the proper construction and meaning of the correct solution, and its relationship to that of Marx. The major exception to this seems to be Yaffe, who maintains that,

the average profit is calculated on the average social capital, and with the formation of prices of production the capitalist recovers money in proportion to the *value of the capital consumed* in production plus the average profit on the capital advanced. (Yaffe, 1974: 46)

In other words, Marx's solution is correct,

total value of commodities must be equal to total price and total surplus value equal to total profit. Anything else makes nonsense of Marx's theory of value . . . The reason why inputs are not converted into prices of production in the transformation of values into prices is that it is the *value* of the *capital* consumed in production that is decisive. (Yaffe, 1973: 43,44)

The logic of Jaffe's argument is (at best) obscure. Indeed, at the crucial points he produces no argument at all, simply asserting that his position is the only correct one. His major substantive point is that capitals obtain a 'share of profit in proportion to their share of capital invested as a part of the total social capital.' (Yaffe, 1974: 48) However, he gives no argument to justify evaluating this share in value rather than modified value terms. Thus the argument that capitals must be thought of as fractions of the total capital, while important and correct, is not an argument for or against transforming inputs. I have argued that the fraction must be computed in modified value terms. The reason is that individual capitals are distinguished in circulation, so their description necessarily involves circulation categories.

Yaffe criticizes any attempt to develop a Marxist solution to the transformation problem as a concession to empiricism. The problem with this approach, as was pointed out by Hodgson, is that Yaffe reacts to the undoubted empiricism of vulgar economy by retreating into pure idealism. (Hodgson, 1973) On the ideological level, Yaffe's assertion that 'Anything else makes nonsense of Marx's theory of value' can lead people only to the conclusion that it is Marx's theory of value that is nonsense. The pernicious effect of Yaffe's position, which is, ultimately, simply a sophisticated version of vulgar Marxism with its fetishized attitude toward the primacy of production, is that it opens the way for neo-Ricardians such as Hodgson to preempt the field of discussion.

A word should be said about Bortkiewicz's 'solution'. It is the most well known discussion of the transformation problem because of its inclusion in Sweezy's popular text. (Sweezy, 1968: 109-30) Actually Bortkiewicz proposed two solutions, publishing both in 1907. One was a careful and rigorous discussion, using the (ideological) Ricardian technique of treating constant capital as dated labor. (Bortkiewicz, 1952) While this solution is Ricardian through and through, and so removes the critical component of Marx's conceptions, it can at least be discussed analytically and rigorously. Unfortunately, the same cannot be said of Bortkiewicz's second solution, the one Sweezy chose to publish in his text and translate for his Böhm-Bawerk collection. (Bortkiewicz, 1949) This

solution introduced the three-department model, which may be a useful approximation under certain circumstances but is not fundamental to the problem. It furthermore used Marx's scheme of simple reproduction, although it is totally irrelevant to the problem.

Thus, on the one hand, Sweezy was instrumental in bringing the existence of the transformation problem to a wide group of English-speaking Marxists. On the other hand, he was silent as to the implications of Bortkiewicz's neo-Ricardian position. Even worse, the solution he presented was confused and intertwined with extraneous and irrelevant factors. The overall combination could not help but discourage people from pursuing the problem further. The effect was thus to make serious discussions of the theory of value quite difficult, a result which is not inconsistent with Sweezy's later work which avoided the concepts of value and surplus value altogether, in favor of the ill-defined notion of the 'economic surplus'. (See, for example, Baran and Sweezy, 1966)

v The contemporary Neo-Ricardian critique

It was soon realized that the Bortkiewicz solution popularized by Sweezy was inadequate. The first to point this out was Winternitz, who showed that the schemes of simple reproduction had nothing to do with the transformation problem, even while he remained within the three-department approximation. (Winternitz, 1948) Winternitz's approach, which is closely related to input-output techniques rather than dated-labor techniques (the two are equivalent in the neo-Ricardian problematic) was generalized in a neglected paper by May, and by Seton, which removed the restrictiveness of the three-department model. (May, 1949; Seton, 1957)

At this point the nature and parameters of the problem had been almost completely specified. Unfortunately, the discussion took place in academic journals that are not very accessible to most Marxists, particularly in comparison to the popularizations of Sweezy and Mandel which ignored these advances. (Sweezy, 1968; Mandel, 1968) Furthermore, both May and Seton viewed the problem, in good neo-Ricardian style, as essentially a technical problem of mathematical economics. The role of value as the central category with which to understand the economic law of motion of the capitalist mode of production is a closed book to this school.

Following the publication of Seton's paper, which conclusively ended the debate about the mathematical factors involved, the discussion has proceeded in a couple of related directions. On the one hand, there have been attempts to find the most general mathematical statements that can be made about the value and price systems. (See, for example, Marishima, 1973, 1974; Okisio, 1963)

On the other hand, the contemporary neo-Ricardian attack has forced Marxists to clarify the fundamental aspects of the problem. (For the neo-Ricardian attack on Marxism, see, Steedman, 1972, 1973, 1975a, 1975b; Hodgson and Steedman, 1975; Hodgson 1973, 1975; for Marxist responses see Laibman, 1974; Yaffe, 1974, Shaikh, 1974) I shall enter this debate after a brief discussion of the Winternitz-Seton solution.

Seton's generalization of Winternitz's 1948 solution begins with Eq. (1), generalized to the case of N commodities,

$$w_i = c_i + v_i + s_i \quad (12)$$

Using the definition of 'cost price', k_i , given in Eq. (6) this can be written,

$$w_i = k_i + s_i \quad (13)$$

Now Seton noted that the value of the constant capital, c_i , is composed of the sum of the values of all of the means of production used in producing commodity i . Let c_{ij} be the value of commodity j transferred to commodity i in the course of production of one unit of the latter. Then,

$$c_i = \sum_j c_{ij} \quad (14)$$

Similarly, the value of labour power is the sum of the values of all of the commodities, including services, socially necessary to reproduce it.³⁶ Thus, letting v_{ij} be the value of commodity j necessary to produce the labor power needed to produce one unit of commodity i , we have,

$$v_i = \sum_j v_{ij} \quad (15)$$

and

$$k_i = \sum_j (c_{ij} + v_{ij}) = \sum_j k_{ij} \quad (16)$$

$$w_i = \sum_j k_{ij} + s_i \quad (17)$$

Now define x_x to be the transformation factor that modifies the value of commodity i . That is,

$$\bar{w}_i = x_i w_i \quad (18)$$

$$\bar{k}_i = \sum_j k_{ij} x_j \quad (19)$$

Seton's equation for the transformation from values to modified values is then,

$$x_i w_i = (1 + r) \sum_j k_{ij} x_j \quad (20)$$

That is, the modified value \bar{w}_i exceeds the modified cost value \bar{k}_i by an amount given by the rate of profit times the modified cost value.

Thus both inputs and outputs have been modified in a consistent manner. If we restrict ourselves to a world in which only three commodities are produced, and further specify that they are means of production, articles of consumption and luxury goods, corresponding to the decomposition of value into constant capital, variable capital and surplus value (in the model of simple reproduction) respectively, then Eq. (20) becomes Winternitz's model.

Eq. (20) has the following features. The unknowns in them are the n transformation coefficients x_i , one for each commodity, and the general rate of profit r . However, there are only n equations, one for each commodity. Thus, it appears at first sight that, with one less equation than the number of unknowns, Eq. (20) can be solved only to the extent of providing a single relationship between these unknowns. However, Eq. (20) is linear and homogeneous in the x 's. That is, in every term one (and only one) x appears raised to the first power. This means that if we find a solution, say, X_1, X_2, \dots, X_N then aX_1, aX_2, \dots, aX_N is also a solution where a is any constant, because the a 's simply cancel out of all terms in Eqs. (20). Furthermore, it is a property of Eqs. (20) that they can be solved (in principle) for the rate of profit r , independent of the ambiguity in the normalization of the x 's. There are, in general, n solutions for r . Presumably the largest is the one that corresponds to the actual rate of profit.

The upshot is that the entire ambiguity in Eqs. (20) concerns an overall normalization factor for the x 's. This ambiguity can be resolved only by adding an independent normalization condition to Eqs. (20). *This normalization condition has nothing to do with the mathematics of the transformation procedure.* This, then, is a complete solution as far as the formal structure of the problem is concerned.

Seton's equations are not, in fact, the way that neo-Ricardians prefer to formulate the problem, even when they use the input-output type of approach.³⁷ Rather than using the value input-output coefficients, \bar{k}_{ij} , that is, the *value* of commodity j needed to produce one unit of commodity i , the neo-Ricardians start from physical (technical) input-output coefficients, a_{ij} , which are the *amount* (in appropriate physical units) of commodity j needed to produce one unit of commodity i . These technical coefficients are completed by specifying the amount of direct labor, l_i , needed to combine the inputs a_{ij} and transform them into the output unit of i . From these coefficients two systems can be derived (see, for example, Morishima, 1973, for the most detailed exposition).

Value System

The value, w_i , of one unit of commodity i is the solution of,

$$w_i = \sum_j a_{ij} w_j + l_i \quad (21)$$

Price System

To derive the equations of the price system a couple of auxiliary concepts relating to wages must be introduced. Let b_i be the amount of commodity i necessary to produce one day's labor power, and let T be the length of the working day. Then if the price of one unit of commodity i is denoted by p_i the p_i 's will be the solution of,

$$p_i = (1 + r) \sum_j (a_{ij} p_j + \frac{l_i b_j p_j}{T}) \quad (22)$$

where the first term on the right hand side represents the cost price of the means of production and the second term the wage cost.

Eq. (21) states simply that the value of any commodity consists of the sum of the transferred value of the means of production and the new labor l_i . Eq. (22) is the analogue of Eq. (20). The neo-Ricardians usually do not include the second term on the right hand side because they view workers and capitalists as 'sharing' the net physical product. Thus they do not calculate profits on the capitalist's total outlay, but only on the outlay for constant capital. (See, for example, Sraffa, 1960) The ideological bias of neo-Ricardianism is clear here, as has been pointed out by Lebowitz (1974). However, even if this fundamental error is corrected, as has been done in constructing Eq. (22), the neo-Ricardian scheme remains inadequate, as will be seen. The point is important because this is precisely the correction made by Emmanuel in his discussion of Sraffa. (Emmanuel, 1972: Appendix V; see also Medio, 1972) Thus Emmanuel's criticism of Sraffa (and Ricardo) remains within the classical framework. It does not cross the critical boundary to Marxism, although it is doubtless a more sensible formulation than that of Sraffa.

Note that Eqs. (21) can be solved for the N values W_i since there are N equations and only N unknowns. Eqs. (22) have the structure of Eqs. (20). They can be solved for the rate of profit, r , and for the N prices, p_i , up to an overall normalization factor.

The neo-Ricardian critique of the Marxist solution can now be specified by relating Seton's Eq. (20) to Eq. (21). This has already been partially done by noting that the term $\sum_j a_{ij} w_j$ in Eq. (21) is the value of the constant capital transferred to the final product. Thus,

$$c_{ij} = a_{ij} w_j \quad (23)$$

The term, l_i is taken to be the newly created value. It can be broken down into the value of labor power and surplus value as follows. Since b_i is the set of commodities necessary to produce one day's labor power, $\sum_j b_j w_j$ is the value of that day's labor power. The working day T , then, decomposes into two parts:

- (1) $\sum_j b_j w_j$, the value of labor power;
- (2) $T - \sum_j b_j w_j$, surplus value.

So if l_i is written

$$l_i = l_i \left(\frac{\sum_j w_j b_j + T - \sum_j w_j b_j}{T} \right) \tag{24}$$

it has been divided into parts proportional to the value of labor power and surplus value. That is,

$$v_i = \frac{\sum_j w_j b_j}{T} \tag{25}$$

$$v_{ij} = \frac{l_i w_j b_j}{T} \tag{26}$$

$$s_i = l_i \left(\frac{T - \sum_j w_j b_j}{T} \right) \tag{27}$$

Thus, Eq. (21) can be rewritten, using Eqs. (23), (26), and (27) as,

$$w_i = \sum_j c_{ij} + \sum_j v_{ij} + s_i \tag{28}$$

which is the form of Seton's equation. In other words, Seton's equation looks like a rewriting of the input-output equation for value.

However, and this is the crucial point, the neo-Ricardians claim that Eqs. (21) and (22) are primary. In fact, they say, why even bother to solve Eq. (21) for values when the transformation, as given by Eq. (22) is, in actuality, from physical inputs to prices? Even more, they argue, Seton's Eq. (20) is not a suitable starting point for carrying out the transformation procedure because his coefficients k_{ij} contain the values w_i , which themselves can only be computed from Eq. (21), that is, from the a_{ij} 's. Thus it is not a choice between two equally good starting points, the k_{ij} or the a_{ij} . Only the a_{ij} , say the neo-Ricardians, provide an adequate starting point.

In mathematical terms the argument runs as follows. Seton's Eq. (20) is useless, say the neo-Ricardians, unless we use Eqs. (23) and (26) to write,

$$k_{ij} = a_{ij}w_j + \frac{l_i b_j w_j}{T} \quad (29)$$

which, when substituted into Eq. (20) yields,

$$x_i w_i = (1 + r) \sum_j (a_{ij} w_j + \frac{l_i b_j w_j}{T}) x_j \quad (30)$$

But this is exactly the neo-Ricardian transformation Eq. (22) if we identify

$$p_i = w_i x_i \quad (31)$$

Thus, the neo-Ricardians argue, either Eq. (20) is meaningless, or it must be supplemented with additional information, namely the a_{ij} and the l_i . But then why bother to go through these steps, since this supplemental information only turns Eq. (20) into Eq. (22), which could have been derived directly from the a_{ij} and the l_i in the first place? The argument, in short, is that the transformation is really from physical inputs to prices. The transformation from values to modified values is an intermediate step in this process and can equally well be omitted. The linking equation is Eq. (31), which links prices to modified values, and hence to values.

This argument is implicit in all discussion of neo-Ricardian solutions. It has been made explicitly most recently by Steedman (1975a: 78-9, esp. Fig. 1). Joan Robinson too is quite straightforward about it, '... the *values* which have to be "transformed into prices" are arrived at in the first place by transforming prices into *values*.' (Robinson, 1950: 363) Curiously, Yaffe accepts this logic:

Only an empiricist methodology saves the other critics of Marx from Bortkiewicz's eventual conclusion 'we are thus driven to reject Marx's derivation of price and profit from value and surplus value'. (Yaffe, 1974: 32n)

It is important to clarify exactly what is wrong with this argument. Not to do so would be either to leave oneself open to neo-Ricardianism or to put oneself into Yaffe's position. I have complicated Eq. (22) by adding the second term on the right hand side in order to be able to locate the flaw precisely. It is not Sraffa's ideological position that capitalists do not make profit on variable capital that is essential. As mentioned above, Emmanuel's model corrects this point yet still leads to the neo-Ricardian conclusions concerning the relationship of price and value, as Emmanuel himself knows quite well,

It is, I think, this contrast between absolute value and relative value that is the crux of my disagreement with Charles Bettelheim. I do not believe in absolute value. (Emmanuel, 1972: 326)

The problem with the neo-Ricardian critique lies in their misunderstanding of the nature of the commodity as discussed in the very first pages of *Capital* (see Section II, above). For Marx, a commodity is the unity of two contradictory aspects—use value and value. The neo-Ricardian insistence on the primacy of the a_{ij} and the subordinate and derived status of the w_i denies this unity. *They reduce commodities to their use value alone, and derive values (which naturally then have very little meaning or use) from the physical relationships of these use values.*

Recall that the dual nature of the commodity rested upon a more fundamental duality, that of labor. *Abstract labor, as such, nowhere appears in the neo-Ricardian formulation.* The quantities l_i represent concrete labor. But the substance of value is abstract labor. I have argued that these two aspects of labor are irreducible. Marx's theory of value is not a theory of price. Thus it is Eq. (21) that is wrong. Involving only technical coefficients, as it does, this equation denies the historical nature of commodity production.

Perhaps the best comparison between the neo-Ricardian approach to the transformation problem and the Marxist approach comes from contrasting Eqs. (18) and (31). The difference appears quite sharply. The Marxist approach transforms values into modified values. Value is the fundamental category on both ends of the transformation. The neo-Ricardian approach transforms values into prices. Thus the independent existence of value is denied because it does not survive the process of transformation. In fact, since the input values are simply calculated from technical coefficients, value is cut out as a category altogether. Thus the technical basis on which to maintain a Marxist approach in the face of the neo-Ricardian challenge is found in insisting on the fundamental nature of value, and, more fundamentally, between two levels of theoretical construction.³⁸

In short, not surprisingly the neo-Ricardians exhibit exactly the limitations that Marx criticized in Ricardo. They do not distinguish between concrete labor and abstract labor, and so cannot ask 'why labor is represented by the value of its product . . .' For them, production is a matter only of technique. Production relations are conceived of as technical relations, while distribution relations, understood as the respective shares of capital and labor in the net product, are social relationships. Seton's Eq. (20) is correct from the Marxist point of view for the precise reason it is unsatisfactory to the

neo-Ricardians. It involves both technical coefficients, the a_{ij} and the l_i , and abstract labor w_i . This is no disadvantage but expresses the two-fold nature of the commodity and is a reminder that Marx's theory of value is not a theory of price in the strong sense. The neo-Ricardians, holding opposite views on all of these matters, wind up by completely liquidating the category of value from their considerations.

vi The problem of normalization

The question of normalization can now be discussed. As with so many of the issues raised by the transformation problem it has been the subject of a seemingly endless debate. Seton was the first to show systematically that the difference between various solutions lay in their choice of normalization. Marx himself initiated the discussion by the emphasis he placed upon the fact that in his solution total value equals total price and total surplus value equals total profit. Subsequently, when it was discovered that these conditions could not be maintained simultaneously when both inputs and outputs are transformed (essentially because there is only one degree of freedom to the solution) several candidates were put forward in the form of quantities whose magnitude would remain invariant under the transformation.³⁹

It is sometimes denied that a normalization condition can be at all meaningful. Thus, Seton, who maintains the correctness of and necessity for transforming values, claims that there can be no basis for choosing a normalization,

The point which concerns us here is that *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: 153)

By 'objective basis' Seton means, of course, mathematical necessity following from the equalization of the rate of profit. This is where Seton's commitment to classical political economy is made manifest. The denial of the 'non-economic' nature of the criteria leading to a choice of normalization, and of the necessity to make a correct choice, is the final refuge for those who attempt to use the transformation problem as the basis for an attack on the theory of value. In fact, the problem of correct normalization cannot be solved by formal mathematics.

The necessity for choosing a normalization lies in the concept of value itself, together with the approach taken here which holds that it is value that appears at both ends of the transformation. Normalization converts the transformation from one yielding only relative modified values to one yielding absolute modified values. Now, in fact, the question of absolute as opposed to relative value does not first arise in the transformation problem. It appears at the level of Volume I, when Marx moves from the phenomenal existence of exchange value, a relative concept, to the existence of value itself, an absolute concept. He does not give an argument for the existence of value but makes an assertion: 'The properties of a thing are not the result of its relations to other things but only manifest themselves in such relations . . .' (Marx, n.d.: 63) This assertion is a crucial element of Marx's value theory.⁴⁰ The existence of value, the link between production and circulation, is intimately connected with its existence as an absolute, and not merely a relative, concept.

Far from being a subordinate, side aspect of the transformation problem, something in the nature of a loose end, *normalization is, in fact, the central aspect.*⁴¹ Indeed, it is the mathematics embodied in Eqs. (20) that is the subordinate aspect. The derivation of Eqs. (20) required no great insight. They are simply the mathematical expression for the equality of profit rates. This is easily understandable since they refer to a problem that has its roots in circulation, the nondominant aspect of the economic region. Solving these equations exactly is beyond our capability, but it entails no conceptual problems outside of those located in the fact that Marx's value theory is, in the first place, not a quantitative theory of price but of price changes. Viewing the transformation problem as a transformation from production in itself to the unity of production and circulation linked by value, however, we see that it is precisely the normalization that provides the link. Without normalization, only a transformation to relative modified value exists, which is not surprising since only the requirement of equal profitability has been imposed. It is normalization that insures that the linkage between production and circulation has been constructed properly.

In this light, the choice of normalization is fairly obvious. For total value is the link between production and circulation, and so it must remain invariant. Thus, in addition to Eqs. (20) a final equation specifies the transformation problem completely. It is,

$$\sum_i w_i = \sum_i w_i x_i \quad (32)$$

Only this choice insures that value, a social property of commodities, continues to be the same property after transformation as before, although its significance has changed. It is no problem that this is insured only at the level of total value, for value is, in the first place, a social quantity, the value of individual

commodities existing only as fractions of the total social value. *Thus the transformation problem is not a transformation of value into something else, but a modification of the specific weights carried by commodities as parts of the invariant total value.*

Recently it has been shown that Marx's own solution is the first step of an iterative solution to the correct Eq. (20). (Shaikh, 1974; see also Morishima, 1973, 1975) Shaikh asserts that the iterative solution is somehow truer to Marx's intentions than an algebraic solution would be. (Actually, it is impossible to solve Eqs. (20) in the general case without some method of approximation.) This assertion is hardly tenable. A method of calculation is only that—a method. If, starting from the same input, two methods of calculation yield the same result, then they are equivalent. One or the other may be more transparent, or illuminate different aspects of the problem, but it cannot be asserted that one is 'right' and the other 'wrong'. Shaikh sees method of calculation rather than normalization as the choice. For him, the problem of normalization only arises from 'a confusion between value and exchange value.' (Shaikh, 1974: 25) However, Shaikh too has to choose a normalization condition in order to carry out the iteration procedure, which, in fact, will only be a solution if the same normalization is chosen at each iteration. He chooses total value invariance. Of course, starting from Marx's own solution one could equally well choose surplus value invariance and arrive at a 'correct' solution. Thus the method of calculation can in no way avoid the crucial problem of choosing a normalization. Shaikh's demonstration provides a valuable clarification of the transformation problem. However, he goes too far in asserting that an algebraic solution 'severs' the link between value and exchange value and 'forces' one to 'reject' Marx's solution. The link is severed only if the normalization is incorrectly chosen, and this choice is independent of the equations that express equal profitability.

With this solution to the transformation problem it will in general not be the case that total real surplus value is equal to total real profit. It is true that Marx emphasized this condition as much as, or even more than, that of total value invariance. From this it is sometimes maintained that the impossibility of the simultaneous validity of these two invariance conditions is a proof of the inconsistency of the transformation procedure or even of the theory of value itself.

In fact, the argument for total surplus value invariance is not a strong one. Recall that total value invariance is fundamental. It insures that value, as a social category, is present on both sides of the transformation. However, while surplus value is present at the level of production in itself, profit is not. Profit is a category that develops only at the level of the unity of production and circulation, since it is

a category that develops out of capitalist competition. Thus profit is not a value form, but enters with exchange value and price.⁴² Because profit is not a value form there are no fundamental arguments that demand its invariance. Indeed, as an exchange-value and price form profit shares the property of all such forms that they can differ from the value that underlies them.⁴³

The possibility of a divergence between real surplus value and real profit is sometimes denied on the ground that it is essential to Marx's theory of exploitation that profit be a converted form of surplus value. Two responses can be made. The first is that, as discussed above, the theory of surplus value is not primarily a proof of exploitation but an element in understanding the development of the capitalist mode of production. If in this case real profit is not equal to real surplus value, then so be it. We will presumably learn something about the economic laws of motion that was not previously known. In the second place, it has been shown that real profit is nonzero if and only if real surplus value is nonzero (see, for example, Morishima, 1974)⁴⁴ Thus the deviation between the two is just that, a deviation. There is always a nonzero core of real profit that is equal to real surplus value (even if the deviation is negative).

The technical reason that real profit and real surplus value may deviate from one another is simple. Total value is invariant. However, its parts need not be, and in general will not be, invariant as well. In particular, the total value of labor power and the total value of constant capital may lie above or below their respective modified values. Thus the difference between profit and real surplus value is rooted in the difference between cost value and modified cost value. The discrepancy opens up an interesting possibility. Discussions of the falling rate of profit, one of Marx's economic laws of development, usually take place using an incorrect expression for the rate of profit, namely, that given by Marx's incorrect solution to the transformation problem, Eq. (4). Even so there is some question whether this quantity shows a tendency to fall. However, profit can and generally does deviate from surplus value, and this corresponds to an opposite deviation of cost price. If the deviation is in the direction of increasing profit over surplus value, then an entirely new mechanism countering the fall in the rate of profit is exhibited. Further investigation is required to determine the conditions under which this mechanism could be effective, and to correlate it with actual conditions. It remains the case, however, that there is not much point in discussing something as complicated as the falling rate of profit, while using the wrong expression for this rate.⁴⁵

IV Summary

As a technical problem in mathematical economics the transformation problem is not difficult. The real difficulties arise in understanding between what objects the transformation operates. The position argued in this paper is that the transformation is between two theoretical levels, the first of which constructs the dominant instance of the economic level, namely production, while the second constructs the economic level as the complex unity of production and circulation. These theoretical steps are necessary not because they represent successive approximations to reality, that is, as models, but because this is the only way to clarify the articulation of a complex structure. In this sense the transformation problem we have been considering is only one of a set of such transformations, which arise whenever theoretical investigation increases the complexity of the level structure of a complex object. In the present case of the economic level of the capitalist mode of production the problem is complicated by the fact that the nondominant aspect, circulation, is nevertheless the place in which social links are created. It is this complication that leads to so many of the confusions that surround the transformation problems.

The analysis of value, the articulation of production and circulation, and the discussion of the transformation problem presented in this paper substantiate the view that Marx's work is not simply a superior version of bourgeois economic theory—replacing 'economics' with 'political economy,' or 'political economy' with 'radical political economy,' or even 'Marxist political economy.' Marx's scientific discovery is not a new version of a preexistent science, economics, but a new science, historical materialism. Of course, as much as the transformation problem is central in obtaining a correct understanding of the capitalist mode of production, it is still only preliminary. For the goal is to ground strategies and not simply to understand Marx's method. (Unfortunately, much of the debate between the neo-Ricardians and Marxists has been conducted as if this were what was at stake.) It is not so much a matter of crudely applying the transformation problem to concrete phenomena as of drawing appropriate conclusions at each level. An important area has been indicated in the discussion of the bourgeois class and the state in Section III. The positions grounded there in Marx's solution are even more secure in the light of the correct transformation. Thus the structure of the political level is articulated with the structure of the economic level in a concrete fashion. At the economic level itself a possible conclusion is contained in the suggestions made concerning the relationship of the falling rate of profit to the correct solution to the transformation problem.

In general, any discussion that would be grounded in the production relationships of the capitalist mode of production must take place in the light of the correct approach to and understanding of the transformation problem. And more than this, the kinds of transformation that are relevant to the transition from the competitive to the monopoly stage of capitalism must be investigated. Finally, the concept of the capitalist mode of production must be fully constructed and 'concrete analyses of concrete situations' produced. These are the kinds of analyses that have to be made, and the work has barely begun, in order to move debates about Marx's method.

Notes

1. A good survey of the neo-Ricardian critique of the neo-classical synthesis is that of Harcourt (1972); see also Hunt and Schwartz (1972), and Harcourt and Laing (1971). The classical statement is that of Sraffa (1960). Lebowitz (1974) suggests that the proponents of the two theories be identified with two sectors of the bourgeoisie, rentiers for the non-classical school (here Lebowitz follows Bukharin, 1972), and technocrats for the neo-Ricardians, and thus connects the theoretical struggle with a class struggle within the bourgeoisie.

2. For the beginnings of such an assessment see Szymanski (1973), whose assessment, with which I concur, is that Baran and Sweezy misread contemporary capitalism because they 'generalize from the special conditions of the postwar era, to general laws of monopoly capitalism prematurely' (1473). See also Mattick (1969).

3. Criticisms of the Second International are abundant. See for example, Colletti, 1972: 45–108; for the Third International see the important work by Bettelheim (1974).

4. 'Once for all I may here state, that by classical Political Economy, I understand that economy which, since the time of W. Petty, has investigated the real relationships in bourgeois society, in contradistinction to vulgar economy, which deals in appearances only, ruminates without ceasing on materials long since provided by scientific economy, and there seeks plausible explanations for the most obtrusive phenomena, for bourgeois daily use, but for the rest, confines itself to systematizing in a pedantic way, and proclaiming for everlasting truths, the trite ideal held by the self-complacent bourgeoisie with regard to their own world, to them the best of all possible worlds.' (Marx, n.d.: 85n) Keynes' definition of classical political economy eliminates the category of vulgar economy. (Keynes, 1964: 3n) The neo-classicists go him one better by calling Marx's classical school preclassical. They themselves are an outstanding example of what Marx meant by vulgar economy. The dogmatic which formed an important component of the Second and Third Internationals can be classified as vulgar Marxism according to Marx's own definition.

5. This was clarified by Gramsci in his prison writings 'When you don't have the initiative in the struggle and the struggle itself comes to be identified with a series of defeats, mechanical determinism becomes a tremendous force of moral resistance, of cohesion and of patient and obstinate perseverance. "I have been defeated for the moment, but the tide of history is working for me in the long term"' (Gramsci, 1971: 336)

6. Several attempts to draw this line have been made recently. See for example, Rowthorn (1974); Medio (1972); Lebowitz (1974); Roosevelt (1975).

7. Of necessity I have presented the barest outline of Althusser's structural theory. For details see Althusser and Balibar (1970), especially pp. 165 ff., 225-53. An extremely important but not widely read essay from the first edition of *Reading Capital* is once again in print. (Establet, 1973) In this essay Establet locates the articulations of *Capital* in much the same way that I do, although he does not focus on the importance of the transformation problem to concretize his 'articulation II.'

8. Balibar shares certain positions with vulgar Marxism in so far as he tends to consider the economic level in its productive aspect alone. Thus he does not consider the articulation between production and circulation which is such a crucial feature of *Capital*. This reductionist perspective goes hand in hand with his identification of the concept of 'mode of production' with the economic level alone, that has been criticized by Poulantzas (1973), p. 13.

9. 'For all the controversy generated by the "labor theory of value" it was tangential to classical value theory, and seldom was it even alleged that any substantive conclusion would be different without it.' (Sowell, 1974: 110)

10. These issues are still very much alive. Aspects of Smith's theory have been revived by Emmanuel in his theory of unequal exchange, although he presents it in an apparently Marxist framework. Emmanuel's work is an example of an attempted reconstruction of Marxism that winds up as a revival of classical political economy. (Emmanuel, 1972)

11. 'All the implements necessary to kill the beaver and deer might belong to one class of men, and the labor employed in their destruction might be furnished by another class; still their comparative prices would be in proportion to the actual labor bestowed, both on the formation of the capital and on the destruction of the animals. Under different circumstances of plenty or scarcity of capital, as compared with labor, under different conditions of plenty or scarcity of the food and necessities essential to the support of men, those who furnished an equal value of capital for either one employment or for the other might have a half, a fourth, or an eighth of the produce obtained, the remainder being paid as wages to those who furnished the labor; yet this division could not affect the relative value of the commodities. . . ' (Ricardo, 1965: 13-14)

12. Underlying this paper is the view that there is no such thing as 'Marxist Political Economy.' Marx founded a new science, historical materialism, rather than improving an old one, whether it be called economics or political economy.

13. This has nothing to do with the question of market fluctuations. Ricardo's labor prices are the center of market price fluctuations just as are Marx's exchange values. The distinction between value and price is not to be found in the process of exchange but in the articulation of production and exchange.

14. This is one of Sweezy's errors. Indeed he refers to the 'qualitative value problem' and the 'quantitative value problem' as if they were somehow two separable things. (Sweezy, 1968: 23, 41)

15. The United States has maintained its lead in this questionable endeavor. Braverman (1974) shows how far we have come in making abstract labor a social reality.

16. An example of this ambiguous terminology, in an area of great importance, is found in the notion of *organic composition of capital*. In the first volume of *Capital* Marx writes, 'I call the value composition, in so far as it is determined by its technical composition and mirrors changes of the latter [my emphasis] the *organic composition of capital*.' (Marx, n.d.: 574) On the other hand, in Volume

III we find, 'The value-composition of capital, in as much as it is determined by, and reflects, its technical composition is called the *organic* composition of capital.' (Marx, 1971: 145-46) The Volume I definition makes organic composition a more inherently dynamic quantity than does the Volume III definition. In any event, it is fairly safe to say that almost no one treats organic composition as dynamic. Thus, when organic composition is used it is really value composition that is meant. The exception to this is Morishima, who discusses just this point. He misses, however, the fact that even value composition must be thought of as a dynamic quantity. (Morishima, 1973: 34-35)

17. It is perhaps worth noting that the major alternative to making the transformation problem to site of the unity between production and circulation is to locate this unity in the reproduction schemes. This was Luxemburg's choice. Thus we can say that while Luxemburg recognized the necessity to construct a complex unity of production and circulation, her choice of solution condemned her to a simple unity emphasizing circulation. In this regard see the comments of Palloix (1975: Vol. II, 41). See also Establet (1973).

18. For an extended statement see Steedman (1973: 40-41) and Bose (1975). General proofs of the theorem, using elegant mathematical techniques, are given by Okisio (1963) and Morishima (1973, 1974). Hodgson (1975) argues that neo-Ricardian results are simply statements of formal logic that can be given either Ricardian or Marxist content, a point of view with which I disagree.

19. See Marx's critique of Ravenstone, Hodgskin, and Bray. (Marx, 1971b: 238-325)

20. This passage appears in a discussion of the genesis of capitalist ground rent, that is, in a discussion of the transition between two modes of production characterized by different mechanisms of surplus extraction: feudalism by rent, and capitalism by surplus value.

21. Some thorny problems of interpretation crop up when we try to maintain a correct understanding of value and still follow Marx's own arguments. I have argued that Marx's theory is, in principle, not a theory of price, but at best of price changes. Yet it seems to be necessary to refer to commodities exchanging at their values. Probably a better language is needed, perhaps more mathematical. In the absence of this development the special and restricted meaning of statements such as that in the text above must be kept in mind. Part of the problem cannot be overcome since it lies in Marx's method. Volume I refers to a (nonexistent) world of production considered abstractly. This is not a model, that is, an approximation to reality which will later be corrected. Volume I deals with production because it is the dominant structure. Nevertheless, the categories used refer to circulation, and, moreover, will change meaning when circulation is introduced explicitly.

22. This is obviously a very complex idea, for labor power is not like other commodities but is unique. Some of the questions this raises are the significance to be attributed to the 'moral and historical' element in the value of labor power, and the way in which the domestic work of production and reproduction of labor power interconnects with capitalist commodity production.

23. Questions can be entertained about the validity of this statement. In the first place, there is the matter of skills and skilled workers, the value of whose labor power is greater than that of unskilled workers. This difficulty can, perhaps, be handled within Marx's framework. A more serious problem is the existence of structured labor markets as an apparently fundamental feature of the current stage of the capitalist mode of production. Marx predicted a trend toward the homogeneity of labor, instead the trend may be toward duality.

Finally there is the question of how these difficulties relate to the notion of the labor aristocracy, itself a problematic conception. See Braverman (1974) for a recent statement of some of these problems.

24. For a discussion of the use of the concept 'tendency' in classical political economy see Sowell (1974: 132-35).

25. Just as with labor market structure there is the problem of capital structure. In fact, the two are related. Capital is not perfectly free to move at will. Monopoly, one of the many tendencies of the development of the capitalist mode of production, limits this motion. The question that must be faced is to what extent these features are sufficiently basic to modify the concept of value in a fundamental way. See, for example, O'Connor (1973)

26. I have assumed that there is no fixed capital. This in no way affects the argument.

27. I have avoided using the concept of organic composition for the reasons outlined above in note 16. As written, c/v is actually the value composition of capital. Organic composition refers to particular kinds of value changes, either over time or between industries.

28. This argument is only an indication since it does not take into account the capitalist's motive for introducing new machinery—cheapening the unit cost of production. Nevertheless, no capitalist acts as if his profit comes from his workers alone. This is, as we shall see, a correct perception.

29. As shall be seen, this is where Marx goes partially astray. Eq. (1) structures the total social capital and the pieces of this structure are affected by the introduction of circulation.

30. Marx explained this transformation algorithm using numerical examples. The algebraic discussion in the text is completely equivalent to Marx's tables (Marx, 1971a: 154-57). Algebraically it is immaterial which of Eqs. (4) or (10) is taken to be the definition of R and which is regarded as derived. It is more consistent with the structure of Marx's argument to take Eq. (4) to be more fundamental.

31. This point has been made before. It is emphasized by May (1948, 1949), Yaffe (1974) and Shaikh (1974). Shaikh, however, maintains that w_i and \bar{w}_i are exchange values rather than values.

32. This position is discussed at length, although from a slightly different point of view, by Poulantzas (1973).

Very suggestive is Balibar's demonstration that the connection between the legal and economic structures of the capitalist mode of production is located in the connection between production and circulation. (Althusser and Balibar, 1970: 231)

33. In this regard see Mattick (1972) for a similar point of view developed in the context of a critique of Samuelson's position.

34. For Hilferding's reply see Sweezy (1949).

35. There have been attempts to speculate why Marx did not proceed further to transform inputs. Hodgson blames it on Marx's poor knowledge of mathematical technique (Hodgson, 1973: 51), while Mattick guessed that Marx felt it to be unnecessary because a correct solution would have been no more illuminating than the one he used. (Mattick, 1972: 271)

36. This has been the subject of a broad discussion recently. The problem is the contribution that unpaid domestic work makes to the value of labor power. The statement in the text assumes that this labor does not contribute to the value of labor power. This is argued for in Gerstein (1973).

37. I shall not consider the technique that treats capital simply as dated labor inputs. I have already commented, in section II above, on the ideological implication of ignoring the qualitative difference between labor power and

constant capital located in the fact that they are owned by two different classes. 38. The second Bortkiewicz solution, as transmitted by Sweezy (1949, 1968), makes this error in a particularly confusing manner. Bortkiewicz's solution, as with all solutions in unique up to an overall normalization. Bortkiewicz specified the normalization by setting x_3 , the transformation coefficient in the luxury goods sector, equal to unity. He then identified this sector with the production of the money commodity. Thus Bortkiewicz made the transformation one from value to price through the back door, so to speak, introducing the price of money (a meaningless concept) through the normalization condition.

39. A clear discussion of the various choices is given by Seton (1957) and Laibman (1974).

40. Marx expands on his insistence on absolute value in his comments on Bailey, who attacked Ricardo by asserting that value was only meaningful as a relative concept. (Marx, 1971b: 124–68) Playing down the importance of normalization falls into precisely this error.

41. This position is taken by Laibman (1974) also, although for different reasons.

42. It is this correct understanding of profit that leads Shaikh astray. He holds that 'Value stems from production,' while 'price and exchange value, on the other hand, stem from circulation.' From this he concludes that the transformation does not operate at the level of value but is a 'transformation from real price equal to values to real price of production.' (Shaikh, 1974: 20, 21) The premise is wrong. Exchange value does not stem from circulation, it stems from production and appears in circulation. Shaikh attributes the special property of profit, that it is a category that first appears at the level of the unity of production and circulation, and so appears only as exchange value, to exchange value itself.

43. 'The possibility, therefore of quantitative incongruity between price and magnitude of value, or the deviation of the former from the latter, is inherent in the price-form itself. This is no defect, but, on the contrary, admirably adapts the price-form to a mode of production whose inherent laws impose themselves only as the mean of apparently lawless irregularities that compensate one another.' (Marx, n.d.: 104)

44. Steedman (1975a) has 'constructed' a counterexample to this theorem in the case of joint production, while Hodgson and Steedman (1975) argue that fixed capital must be thought of as joint production. Thus, they challenge Morishima's result in the presence of fixed capital. However, their proof is carried out within the neo-Ricardian framework of the identity of concrete labor and abstract labor, and so, despite their intent, does not 'disprove' Marx's value theory.

45. Again the Marxist solution to the transformation problem leads to a different point of view than the neo-Ricardian solution. See, for example, Steedman's (1975) remarks on the falling rate of profit.

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