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Understanding Capital Volume II

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Introduction

Volume II, it is safe to say, is the least read of the three main volumes of Marx's Capital. This relative neglect is unfortunate, because many issues of concern to contemporary Marxists -- the distinction between productive and unproductive labor, the causes of economic crises, the conceptualization of fixed capital, the treatment of social reproduction -- are addressed in Volume II of Capital. Furthermore, a full appreciation of some of the material in Volume III depends upon concepts treated by Marx in the second volume.

In Volume II of Capital, Marx shifts his focus from the sphere of production of commodities to the sphere of circulation. A consideration of market relations is present, of course, in Volume I, but primary attention is paid there to capitalist production. It is largely assumed, for example, that capitalists can find requisite means of production in the market and can locate buyers for their products. Circulation is crucial to the expansion of capital, for it is only through sale of commodities that produced surplus-value is realized in the form of profit. By raising the issue of economic crisis at a number of points in the text, Marx underscores the problematic nature of the articulation of capitalist production and exchange.
The first part of Volume II traces the transformations that capital undergoes -- the circuit that it describes -- as the capitalist exchanges money for labor-power and material means of production, as these elements of productive capital combine to form a product, and as the commodity-product is exchanged on the market for money. The second part of Volume II, on the turnover of capital, treats the circuit of capital as it unfolds over time; here Marx develops the distinction between fixed capital and circulating capital.

Parts I and II of the second volume are written primarily from the point of view of an individual capitalist. Part III deals systematically with circulation and reproduction from a social perspective, examining the market-mediated relations among different capitals as well as the relationship between production and consumption. In the final chapter of Volume II, Marx demonstrates the theoretical basis for extended reproduction on an economy-wide scale.

Volume II of *Capital* is at once simpler and more difficult to read than Volume I: simpler, because the reader approaches the second volume with an understanding of the basic categories and relations developed by Marx in Volume I and with an appreciation of Marx's method of analysis and exposition; more difficult, because Volume II is an unfinished work. I use the term "unfinished" advisedly, for as Engels writes in the preface (p. 1): "The bulk of the material was not finally polished, in point of language, although in substance it was for the greater part fully worked out." The reader is probably aware that Engels painstakingly pieced together Volume II from a number of partial drafts of the book left by Marx upon his death. The main line of argument is clear, however, and the details are largely present as well, despite some repetition, certain obscure or tedious passages, a few errors, and some infelicities of style and presentation.


Though this guide could be read independently of *Capital*, its essential purpose is to assist the student of Volume II through a reading of that difficult text. The chapter summaries seek primarily to abstract the main line of argument in the text. At certain points -- for instance in connection with the discussion of productive and unproductive labor in Chapter 6 -- reference is made to material elsewhere in *Capital* that is directly relevant to the topic at hand. At other points -- most notably in Chapter 21, where Marx treats extended reproduction -- Marx's presentation is recast in algebraic terms without altering the meaning of the material. Although the non-mathematically inclined reader will find these passages demanding, Marx's development of technical material through
the use of numerical examples often becomes exceedingly difficult to follow. The more abstract algebraic presentation reveals the basic principles underlying the numerical examples. Furthermore, formalization is clearly in the spirit of Marx's work, and, indeed, parts of his presentation make use of algebra. Where appropriate, I have employed diagrams and tables in an effort to clarify the text.

The Marxist Institute course on Volume II of *Capital* divides the text into nine weekly readings. The schedule of readings is reproduced following this introduction. Each week, the class gathers for about two hours of discussion focused by the questions listed at the end of this book.

Several individuals have assisted me in preparing the reading guide to Volume II. Bill Carroll made the useful suggestion that I attempt to diagram some of the processes described in the text; he, Bill Johnston, Larry Lyons, Peter Meiksins, Roxanna Ng, Anne Preyde, and Bob Russell provided me with valuable comments on a draft of the book. In writing the questions for Volume II, I made reference to an earlier question set prepared by Larry Lyons.

Part I

The Metamorphoses of Capital and their Circuits

Chapter 1: The Circuit of Money Capital

"The two forms assumed by capital-value at the various stages of its circulation are those of money-capital and commodity-capital. The form pertaining to the stage of production is that of productive capital." (p. 50 [p.133])

As explained in the Introduction, in the second volume of *Capital*, Marx changes his focus from the process of production to circulation. The first part of this second volume deals with the changes in form (or metamorphoses) of capital, changes that take place both in the sphere of circulation and in the sphere of production. In circulation, capital changes its form through the process of exchange, while in production, capital embodied in means of production and labor-power is materially transformed into new commodities.

What Marx calls the circuit of industrial capital is the totality, or unity, of changes of form taking place in circulation and in production. We shall see that the circuit of
capital is, in reality, a continuous or circular process. In his analysis of the circuit of capital, however, Marx chooses to interrupt the continuous process in three distinct ways, and to consider separately the circuits of money capital, productive capital and commodity capital. As will be made clear presently, these three are the distinct forms that industrial capital assumes in the course of its circuit. The first chapter deals with the circuit of money capital.

Although Marx's approach is difficult at points, his separate consideration of the three forms of the circuit of capital serves to emphasize different aspects of the process, as we shall see shortly. More importantly, later in Volume II, Marx uses the different forms of the circuit for different analytic purposes. For instance, Marx employs the circuits of productive and money capital for his discussion of the turnover of capital in Part II, and the circuit of commodity capital for his analysis of social reproduction in Part III. In the course of his argument, Marx demonstrates how failure to distinguish among the forms of capital and among their circuits seriously compromises the analysis of other political economists.

The circuit of money capital begins with the capitalist in possession of a quantity of money, M, that is to be exchanged for the elements of productive capital. The exchange is an act of circulation, M--C: that is, the exchange of money for commodities of equal value. What distinguishes this exchange as part of the circuit of capital (as opposed to other acts of general circulation) is the particular use-values that the capitalist acquires: means of production and labor-power, which together function within the sphere of production as productive capital. Marx, therefore, diagrams the first stage in the circulation of money capital in the following manner: M--C< L, MP, where L represents the labor-power and MP the means of production purchased by the capitalist. In this act of circulation, money capital functions as money, because it serves as a means of purchase of means of production, and as a means of payment for labor-power. At the same time, money capital functions as capital because the exchange is part of the circuit of capital, in particular representing the acquisition of the elements of productive capital, which will expand their value in the process of production.

The division of money capital into a portion purchasing means of production (constant capital) and a portion purchasing labor-power (variable capital) is a qualitative division, since different use-values are acquired. It is, moreover, a qualitative division with a quantitative basis: for labor-power, once purchased, is employed as labor, and labor of a given quantity requires means of production of a particular amount to function properly in the process of production.

Each act of circulation maybe regarded from the point of view of the buyer and from the perspective of the seller. From the point of view of the capitalist, M--L is an act of purchase; from the perspective of the laborer, L--M is a sale. Having acquired money (i.e., wages) through the sale of labor-power, the worker exchanges this money for means of subsistence, that is, for other commodities. The circulation of labor-power,
therefore, has a circuit of its own, L--M--C, distinct from but related to the circuit of capital. The circuit of capital, moreover, presupposes the class relation between workers and capitalists, and, in particular, the existence of a class of laborers who must sell their labor-power to capital so as to acquire means of subsistence. This class relation and its origin were dealt with in detail in Volume I (Part VIII) of *Capital*. Marx notes, in the present context, that it is not money that creates the class division of workers and capitalists. On the contrary, it is the existence of this division that makes it possible for money to function as money capital, to purchase labor-power as a commodity.

Once the capitalist has purchased means of production and labor-power, these commodities become the elements of productive capital; that is, they are used in the process of production. The circulation of capital is therefore interrupted by production. Marx represents this interruption in the following manner: M--CM--C<\text{1}_{MP} . . . P; where P symbolizes capital functioning within the sphere of production.

The process of production begins with commodities of particular form, means of production and labor-power, and it ends with a commodity of another form, a product. The product embodies the value of the means of production, transferred to it during the process of production. In addition, the product contains newly created value, the embodiment of labor expended in the productive process. Because, under capitalist production, the worker produces surplus-value, value in excess of the value of labor-power, the value of the product is greater than the value of means of production and labor-power comprising productive capital.

Capitalist production is production for exchange -- its product consists of commodities. These commodities are commodity capital because they represent a phase in the circuit of capital, and, more specifically, because they contain the surplus-value yielded by the capitalist process of production. Marx writes the equation C' = C + c, where C represents the portion of commodity capital that is the value equivalent of the money capital (M) that began the circuit, and c represents the portion of commodity capital containing surplus-value.

To realize the value of commodity capital, the capitalist must transform it back into money form by selling it: C'--M'. Capital in the form of commodity capital, therefore, reenters the sphere of circulation. The symbol M' is used because the value realized by the capitalist upon the sale of commodity capital exceeds the money capital originally advanced. This is the case because commodity capital contains surplus-value. The sale of commodity capital, then, represents both the reconversion of original capital-value into money form, C--M, and the realization of surplus-value, c--m.

The complete form of the circuit of money capital may be represented as M--C . . . P . . . C--M', or, in expanded form as M--C<\text{1}_{MP} . . . P . . . (C + c)--(M + m). Note that the lines (--) symbolize acts of exchange taking place in the sphere of circulation, while the dots ( . . . ) represent the functioning of capital in the sphere of circulation.
production. During the course of its circuit, industrial capital successively takes on three forms: money capital, productive capital (means of production and labor-power), and commodity capital. The transformation of money capital into productive capital, and that of commodity capital into money capital, take place in the sphere of circulation, through exchange. The conversion of productive capital into commodity capital (and the augmentation of capital-value) takes place in the sphere of production. Marx implicitly distinguishes here between industrial capital, which as productive capital participates in the process of expansion of value, and other types of capital, which have different circuits. The other types of capital (e.g., merchant's capital) are dealt with in Volume III.

The circuit of money capital ends as it began: with money. At the end of the circuit, therefore, the capitalist is in a position to purchase once more the elements of productive capital. Because the money available to the capitalist at the end of the circuit (M') contains surplus-value, the capitalist can expand the process of production, invest the additional capital elsewhere, or employ surplus-value as revenue for personal consumption. These possibilities are taken up in the next chapter and in the third part of the volume.

The continuous, or circular, nature of the circuit of capital is represented in Figure 1.

Figure 1. The Circuit of Capital.

When (all or part of) M' is reinvested, the symbol M, representing the advance of money capital, is employed; that is, M' represents money capital that includes realized surplus-

Chapter 2: The Circuit of Productive Capital

"The transformation of money-capital into productive capital is the purchase of commodities for the production of commodities." (p. 76 [p. 155])

While the circuit of money capital reveals the motive underlying capitalism (the expansion of value), the circuit of productive capital is useful for examining the reproduction of an individual capital. The abbreviated form of the circuit is P . . . C'--M'--C . . . P. Capital functioning in the sphere of production (P) gives rise to a commodity product containing surplus-value (C'). This commodity capital is changed for money (M'), part or all of which is exchanged, in turn, for new elements of productive capital (C), which once more enter the sphere of production (P).

From the perspective of the circuit of productive capital, the time spent by capital in the sphere of circulation is regarded as an interruption of the productive process, but an interruption that is necessary to reproduction, for the conversion of commodity capital back into the form of productive capital. This part of the circuit of productive capital, C'--M'--C, has the apparent form of the simple circulation of commodities (C--M--C, i.e., selling in order to buy). What distinguishes this movement from simple circulation is not the form of the acts of exchange themselves, but the function of the exchanges within the circuit of capital.

As was explained in the first volume of Capital, if all of the surplus-value is expended by the capitalist as revenue for personal consumption, no expansion of production takes place. Marx calls this process simple reproduction. Alternatively, the expenditure of part of the surplus-value for new elements of productive capital represents capital accumulation, reproduction on an extended scale.

Marx's diagram of simple reproduction is shown in Figure 2.
Figure 2. Simple Reproduction

Here (as in the previous chapter), the commodity product $C'$ is divided into two parts: $C$, representing the value of advanced capital; and $c$, representing surplus-value. The money capital $M'$ for which commodity capital is exchanged is similarly divided into $M$ and $m$. $M$ is once more advanced for new elements of productive capital, $C_{LMP}$, which function in the sphere of production on the same scale as before ($P$). Realized surplus-value $m$ is used to purchase the capitalist's means of consumption, commodities $c$; $m$, therefore, serves not as capital advanced for the purpose of value expansion, but as money spent for personal, as opposed to productive, consumption. The capitalist's personal consumption, $c -- m -- c$, originates in the circuit of industrial capital, but becomes separated from it. In this sense, the capitalist's consumption is similar to that of the worker, represented by the circulation of labor-power, $L -- M -- C$.

The circuit of productive capital makes clear how the continued functioning of capitalism depends upon the class relation between workers and capitalists: the money capital advanced by the capitalist to purchase means of production and labor-power is a converted form of commodity capital, which in turn is the product of the worker's labor. Money capital loses its apparently independent status, and is placed within the context of the reproduction of industrial capital.

As mentioned above, extended reproduction takes place when a portion of surplus-value is advanced for new elements of productive capital, rather than being expended as revenue for the personal consumption of the capitalist. For simplicity of analysis here, Marx assumes that all of surplus-value is employed in this manner, while in reality, even under extended reproduction, some surplus-value is necessarily spent as revenue.

Surplus-value that is to be used to extend the scale of production is accumulated in the form of money. This money must be saved by the capitalist until it is sufficient to purchase new elements of productive capital, either in the capitalist's original enterprise, or in some other business. Money that is removed from circulation is placed in a hoard. Surplus-value hoarded for the ultimate purpose of extending the scale of production is termed latent money capital. It is latent because, while it remains in the form of money, it cannot function as capital, value that expands in the capitalist process of production. Surplus-value accumulated in money form can also serve as a reserve fund — a supply of money capital available to the capitalist to be used when the normal course of the circuit of capital is interrupted. For example, if the conversion of commodity capital to
money is delayed, money in reserve maybe used to purchase the means of production and labor-power necessary to continue the productive process.

At a number of points in Volume II of *Capital*, Marx takes up the topic of the business cycle and capitalist economic crises. This pattern is repeated in the other volumes of *Capital*: although he often deals in passing, and sometimes at length, with the issue of crises, nowhere does Marx present an integrated treatment of the nature, causes, and effects of economic crises.

In the present chapter, Marx points out that the commodity form of the product separates the acts of production and consumption. This separation is especially characteristic of large-scale capitalist production, where several merchants may intervene serially between the industrial capitalist who produces a commodity and the ultimate purchaser who consumes it. (Consumption here refers to either productive or individual consumption.) Overproduction of a commodity -- production in excess of demand -- may therefore not become apparent for some time: the process of reproduction appears to continue normally while, in reality, produced commodities are not absorbed by the market.

The crisis that results has as its ultimate cause a disturbance in the relationship between production and consumption, but the crisis is manifest in the market, and is exacerbated by the intermediary role performed by the merchant. The problematic character of commodity circulation for the process of capitalist reproduction is a theme that echoes throughout the second volume of *Capital*.

**Chapter 3: The Circuit of Money Capital**

"It becomes necessary to elucidate the intertwining of the metamorphoses of one individual capital with those of other individual capitals and with that part of the total product which is intended for individual consumption." (p. 101 [p.178])

The circuit of commodity capital is represented by the "formula" $C'\rightarrow M'\rightarrow C \ldots P \ldots C'$. The components of this circuit are, of course, the same as in the circuits of money and productive capital, although these components are now arranged in a different order. The circuit begins with the commodity product $C'$, which contains surplus-value because it is the result of capitalist production. The commodity product is exchanged for
money $M'$, a portion of which purchases new elements of productive capital $C$. Capital then enters the sphere of production $P$, giving rise to a commodity product $C'$ containing surplus-value. If some of the surplus-value incorporated in the initial $C'$ is capitalized, then the scale of production expands, resulting in a larger terminal $C'$.

Why does Marx introduce this third form of the circuit of industrial capital? We have seen how the first form of the circuit, $M--M'$, serves to emphasize the motive underlying capitalist production, the augmentation of value. The second form of the circuit, $P--P$, provides a natural means for the analysis of the reproduction of an individual capital. The third form of the circuit, $C'--C'$, the subject of the present chapter, emphasizes the relations among different capitals, and those between capital and personal consumption. The circuit of commodity capital, therefore, is employed by Marx in his examination of the reproduction of the total social capital, the aggregate of individual capitals. In a certain sense, then, the third form of the circuit is the most important for a general analysis of commodity circulation, since it is useful in describing the relationships among different economic actors. Marx takes up this approach in detail in the final part of Volume II.

The circuit of commodity capital begins, as mentioned above, with commodities $C'$. As use-values, these commodities exist either as articles of consumption, or as new means of production. If $C'$ represents new means of production, it must be sold to another capitalist, who will employ it as productive capital. In other words, $C'--M'$ for one capitalist is simultaneously $M--C--MP$ for another. If $C'$ comprises articles of consumption, it will be sold to workers or to capitalists for their personal (i.e., unproductive) use. Regardless of its shape and the manner in which it is consumed (productively or personally), however, $C'$ is capital for its producer.

This is the sense in which the third form of the circuit is useful for an analysis of the economy as a whole. Because the beginning and end of the circuit are particular commodities, that is, particular use-values, it is possible to examine how different capitals fit together with each other through exchange of products (what Marx terms the "intertwining" of capitals) and with individual consumption. What was once automatic now becomes problematic: for a capitalist to acquire means of production of a specific variety (say, cloth for a clothing factory, or a sewing machine for the same factory), some other capitalist must have produced these articles. From the opposite perspective, if a capitalist hopes to sell a commodity product, this product must be in demand, either by other capitalists in their roles as producers (if the commodity is to be used productively), or by consumers.
Chapter 4: The Three Formulas of the Circuit

"Capital as self-expanding value embraces not only class relations, a society of a definite character resting on the existence of labor in the form of wage-labor. It is a movement, a circuit-describing process going through various stages, which itself comprises three different forms of the circuit-describing process. Therefore it can be understood only as motion, not as a thing at rest." (p. 108 [p. 185])

In this chapter, Marx consolidates and partially extends the argument of the previous three chapters. He begins by noting that the circuit of capital represents the unity of circulation and production, but not this unity alone. The circuit of industrial capital represents in addition the unity of the three forms of capital and of their circuits.

We have already seen that the circuit of capital takes place partially in the sphere of circulation (where money is exchanged for the elements of productive capital, and where commodity capital is exchanged for money), and partially in the sphere of production (where productive capital functions to create commodity capital). The totality of an industrial capital is, however, at any given moment partially in all three forms: part in money form, ready to be exchanged for labor-power and means of production; part as functioning productive capital; and part as commodity products to be placed on the market.

Moreover, the circuit of capital is a process that unfolds over time. Marx argues that this dynamic aspect of capitalism is crucial to an understanding of the nature of capitalist society. As a formal matter, the idea of expansion of value during the circuit of capital (as a consequence of the production of surplus-value) implies a comparison over time: comparison of the value of advanced capital with the value of the product. Here Marx invokes the distinction between value (embodied labor time) and exchange-value (the manifestation of value in the proportions in which commodities exchange for one another on the market) to refute the misconception that non-contemporaneous comparisons of value are impossible. While it is indeed the case that advanced capital and the commodity product cannot exchange for one another, because they exist at different points in time, it is still sensible to compare their values. Indeed, changes in value of specific commodities that occur during the circuit of capital (as a consequence, e.g., of changes in productivity or in other conditions of production) can cause the process of reproduction to function abnormally. For example, if the value of means of production falls after the capitalist has purchased them, the value of the commodity product is depreciated.

We have seen how a consideration of the circuit of industrial capital entails an examination of the relations among different capitals, relations which are reflected in the exchange of products as commodities. Not all exchange on the part of an individual
capital, however, relates that capital to other capitals. Although a capitalist acquires means of production as commodities, these commodities are not necessarily the product of other capitals: they may originate from non-capitalist modes of production. Indeed, it is in large part through the market that capitalism is ultimately able to transform pre-capitalist modes of production.

Furthermore, even when capitalist production is generalized, not all exchanges are exchanges between capitals. Labor-power purchased by the industrial capitalist is not produced by a capitalist production process. Likewise, when commodity capital is sold to consumers, be they workers or capitalists, the buyers are not functioning in the role of capital. The totality of circulation, therefore, represents more than the market interrelations among different capitals, although it includes these interrelations. Circulation in the aggregate is, as we have pointed out, the topic of the third part of Volume II.

Marx restates this point in a different form by examining the balance of supply and demand for an individual capital. Commodity capital $C'$, representing supply, has three value components: constant capital, $c$, whose value is transferred to the product in the process of production; variable capital, $v$, whose value is recreated in production during necessary labor time; and surplus-value, $s$, created during surplus labor time. The value of constant capital, $c$, also represents demand for means of production purchased as commodities on the market. Variable capital, $v$, is acquired in the form of wages by workers, and is spent by them for subsistence goods. Variable capital, therefore, also represents demand for commodities. Surplus-value, $s$, is spent by the capitalist partially for new productive capital, and partially for the capitalist's consumption. To the extent that surplus-value is hoarded, however, rather than immediately spent, there, is an excess of supply over demand, at least from the perspective of the individual capital under consideration.

As Engels notes, the end of this chapter (pp. 120-123 [196-199]) is drawn from source material separate from that used for the rest of the chapter. In this passage Marx makes reference to concepts -such as fixed capital -- that are not explained until later in Volume II.

Chapter 5: The Time of Circulation

"A capital's time of circulation therefore limits, generally speaking, its time of production and hence its process of generating surplus-value:1(p. 128 [203-204])
In Chapter 5, Marx turns to a brief examination of the time spent by capital in executing its circuit. He returns to this subject in the second part of Volume II, which is concerned with the turnover of capital. Chapter 14, in fact, has the same title as Chapter 5.

We have examined how capital spends part of its circuit as productive capital in the sphere of production, and part as commodity and money capital in the sphere of circulation. It is only during production time that new value -- including surplus-value -- is created. Production time, however, extends beyond the time of the labor process, during which labor functions to create value. Production time consists as well of interruptions in the process of production (as, e.g., when a factory is shut down at night); of the time during which means of production are stored (stockpiled) prior to their actual employment in the labor process; and of interruptions in the labor process when the process of production continues without direct human intervention (as, e.g., in fermentation). When the labor process is interrupted in this manner, no new value is created, although the value of constant capital continues to be transferred to the product as the productive process continues in the absence of labor.

In the sphere of circulation, commodity capital is exchanged for money, and money capital is exchanged for new elements of productive capital. No value -- and, hence, no surplus-value -- is created as a consequence of these exchanges. The time of circulation, therefore, limits the expansion of capital-value, because when capital is in the sphere of circulation, it is kept out of the (value-creating) sphere of production.

Of the two transformations undergone by industrial capital in the sphere of circulation, Marx considers the exchange of commodity capital for money somewhat more problematic and, in a sense, more important: more problematic, because it is generally more difficult to sell than to buy, money being the universal equivalent. This is not to say that the capitalist is necessarily able to find on the market requisite elements of new productive capital. The exchange of commodity capital for money is more important because this exchange is at the same time the realization of surplus-value.

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**Chapter 6: The Costs of Circulation**

"The general law is that all costs of circulation which arise only from changes in the forms of commodities do not add to their value. They are merely expenses incurred in the realisation of the value or in its conversion from one form into another." (p. 152 [225-226])
Marx's discussion of the costs of circulation extends his examination of productive and unproductive labor begun in Volume I of *Capital*. Parts of this chapter are among the most difficult sections in Volume II, and Marx's argument often appears obscure, or even contradictory. To attempt to clarify the distinction between productive and unproductive labor, we shall return at some length to the formulations of Volume I. Then we shall proceed to consider the development of these concepts in the present chapter. Although our reading here is by no means definitive, we shall try to avoid the opposing pitfalls of over-simplification and scholasticism.

Marx's treatment of productive labor in Volume I of *Capital* began at a very high level of abstraction, not in the specific context of the capitalist mode of production. In general, productive labor is labor that produces a useful effect. This labor may or may not be embodied in material objects -- Marx's several examples employing services (e.g., education in Volume I, transportation in the present chapter) make this point clear -- but to be productive, labor must be productive of use-value. Marx goes on to explain that under capitalism the scope of productive labor is both narrowed and expanded: it is narrowed in that only labor producing surplus-value is productive for capital; therefore, from the point of view of capitalism, independent commodity producers do not labor productively, even if they produce use-values in the form of commodities. To work productively, laborers must sell their labor-power to a capitalist and must be exploited, that is, must produce surplus-value for the capitalist. Labor that is exchanged for revenue is not productive, even if it is wage labor, for the labor is consumed directly, not used in the production of value and surplus-value. Thus, personal servants are not productive laborers, because their services are consumed. This is the case despite the fact that a servant may labor beyond necessary labor-time, and therefore be exploited. (In contrast, servants who sell their labor-power to a capitalist enterprise, which then contracts out this labor, are productive, producing value and surplus-value for their employer.)

At the same time, capitalism expands the definition of productive labor as a consequence of the division of labor that it institutes in the workplace. Here, Marx introduces the concept of the collective worker. If laborers participate in the production of a useful effect, that is, function as parts of the collective laborer working for capital, the laborers work productively, even if their labor contributes only indirectly to the production of use-value. Thus, mental labor (e.g., that of draftsmen and engineers) necessary to the productive process is productive labor. Marx differentiates tasks that are intrinsic to the production of use-value from tasks that are necessitated by the capitalist production of these use-values. Labor of supervision, for example, is productive insofar as it fulfills executive functions required by the productive process generally, and unproductive to the degree that it is necessitated by the class antagonism between workers and capitalists engendered by capitalism.

Let us now turn to Marx's discussion of the costs of circulation. The crucial distinction in this discussion is between unproductive costs entailed by the commodity form of the product, necessitating a process of circulation proper (i.e., exchange of values), and
productive costs which are a function of the use-form of the product and, in this sense, are incidental to circulation of values. Circulation as the exchange of values is an abstract process in which the seller acquires money and the buyer obtains title to the commodity exchanged. Material movement of objects ("circulation of matter") does not necessarily take place when commodities are exchanged as values, and, if it does, it is incidental not central to exchange.

The acts of buying and selling, whether these are performed by the industrial capitalist, by wage-workers under the capitalist's employ, or by intermediaries (i.e., merchants) who function exclusively as traders, are therefore unproductive because these functions are entailed by the commodity form of the product.

Note that unproductive wage-workers are exploited when their working day extends beyond necessary labor time, even though they produce no value or surplus-value. These workers' surplus labor serves to decrease the capitalists' unproductive costs. The distinction between productive and unproductive labor, therefore, is not a distinction between social classes.

Costs of storage of commodities are productive insofar as the labor employed in storage is a function of the material properties of the product, and not merely of their commodity form (that is, the fact that they are exchanged as values). Here, Marx argues that the formation of supplies is common to all modes of social production, not just to commodity production or to capitalist commodity production. The particular form of supplies is different under different modes of production, however. In peasant economies, for example, most supplies of means of production and consumption remain in the hands of their direct producers. Under capitalism, the portion of supplies existing in commodity form (as commodity capital) expands greatly. To the extent that the maintenance of a supply is entailed by the commodity form of the product, as, for example, when commodities are kept from the market for speculative purposes, the labor expended in maintenance of the supply creates neither value nor surplus-value: it is unproductive. Moreover, under these circumstances, constant capital employed in storage does not transfer its value to the product.

Marx treats transportation as a branch of industrial capital, even though transport is often entailed by the process of commodity circulation, and despite the fact that transportation does not produce a material product. This treatment is consistent with Marx's general discussion. Transportation produces a useful effect, change of location, and as such adds to the value of the goods transported. Labor in the transportation industry is, therefore, productive labor. We should note, in this context, that transportation as a service may be consumed directly, as in the transportation of passengers.

Marx's treatment of productive and unproductive costs of circulation is made more difficult by his distinction between labor that is productive for the individual capitalist, that is, labor that produces value and surplus-value, and labor that is productive from the point of view of "society." The first sense of productive labor is the sense discussed
above. From the point of view of society, only labor that increases the mass of use-values comprising the social product is productive labor. From this perspective, therefore, all costs of storage, for example, are unproductive, because storage diminishes rather than augments the use-values of the articles stored. This is as true of storage necessitated by the use-form of the product as by its commodity form, despite the fact that storage labor necessitated by the use-form of the product produces value and surplus-value (i.e., is productive from the point of view of the capitalist).

Marx's consideration of labor expended in bookkeeping also presents analytic difficulties. To the extent that bookkeeping is necessitated by commodity exchange, that is, by the exchange of products as values, it creates no new value, and hence is unproductive for the capitalist. Likewise, the instruments of labor employed in unproductive bookkeeping activity (e.g., writing implements, ledgers) do not transfer their value to the product. Marx acknowledges, however, that bookkeeping also serves partially to regulate social production, and, as such, transcends the commodity form of the product. He does not pursue this point, however, because the context of the discussion is the exchange of products as values.

To conclude, then, productive labor under capitalism is labor that produces surplus-value for a capitalist. To produce surplus-value, workers must sell their labor-power to a capitalist, must (as parts of the collective worker) produce a use value, material or nonmaterial, and must be exploited. The importance of the productive/unproductive-labor distinction for Marx's political economy lies in his argument that only productive workers make a positive contribution to the production of surplus-value; instead of contributing to the production of surplus-value, unproductive workers must ultimately be paid from it.

Part II

The Turnover of Capital

Chapter 7: The Turnover Time and the Number of Turnovers

"[T]he entire time of turnover of a given capital is equal to the sum of its time of circulation and its time of production. It is the period of time from the moment of the advance of capital-value in a definite form to the return of the functioning capital-value in the same form." (p. 156 [233])
The second part of Volume II of *Capital*, dealing with the turnover of capital, is the least discussed portion of the volume, and perhaps the most tedious to read. Yet, this part of *Capital* is important for at least two reasons: first, Marx extends his account of the circuit of capital, introducing the central distinction between fixed and circulating capital, and tracing the consequences of this distinction; second, Marx attempts to clarify points that are confused in the work of other political economists. The treatment of the circuits of capital in Part I provides Marx with the tools for these tasks.

The circuit of industrial capital is called its turnover, because the process is one that is periodically renewed. The time of turnover is the duration of the circuit. In discussing the topic of turnover, Marx employs the circuits of money capital and productive capital, for these forms of the circuit begin with the advance of capital prior to the production of surplus-value. We shall see that productive capital is particularly central to Marx's treatment of turnover.

Taking the year as a base period, Marx writes the equation \( n = T/t \). In this formula, \( n \) is the annual number of turnovers of a capital, \( T \) is the number of elementary units of time (e.g., months) contained in a year, and \( t \) is the time of turnover expressed in elementary units of time. Marx presents the following example: if a capital turns over in a period of three months, then the annual number of turnovers, \( n \), is \( 12/3 = 4 \).

**Chapter 8: Fixed Capital and Circulating Capital**

"But the instruments of labor never leave the sphere of production, once they have entered it . . . . A portion of the advanced capital-value becomes fixed in this form determined by the function of the instruments of labor in the process. In the performance of this function, and thus by the wear and tear of the instruments of labor, a part of their value passes on to the product, while the other remains fixed in the instruments of labor and thus in the process of production." (pp. 160-161 [237-238])

In this chapter, Marx introduces the distinction between fixed and circulating capital, a distinction that is central to his treatment of turnover. We shall see that this distinction applies to the elements of productive capital, and involves the manner in which the value of different parts of productive capital circulates.

Following the analysis of the labor process in Volume I of *Capital*, in real terms (that is, in terms of use-values), the elements of productive capital comprise raw and
auxiliary materials, instruments of labor, and labor-power. These factors enter differently into the fabrication of the product. Raw and auxiliary materials are wholly consumed in the productive process, although only the former enter materially into the product. Instruments of labor (including, for example, tools, machines and buildings) wear away gradually, and are hence employed in more than one labor process. Together, raw materials, auxiliary materials, and instruments of labor constitute means of production. Labor-power, used as labor, transforms means of production into a product.

In value terms, the value of means of production is transmitted to the product as these means of production are used up in the productive process. The value of raw and auxiliary materials, therefore, is wholly incorporated in an individual product, while the value of instruments of labor is transmitted piecemeal (i.e., is distributed over many products) as their use-value wears away. Because the means of production merely transfer their value to the product, Marx (in Volume I) termed this portion of productive capital "constant" capital. Labor-power, on the other hand, creates new value when employed as labor in the productive process. When the worker labors beyond necessary labor time, surplus-value is created, and the portion of capital advanced for labor-power expands its value in production. Marx, therefore, termed this portion of productive capital "variable" capital.

Marx's consideration of the manner in which different components of productive capital circulate leads to the distinction between fixed and circulating capital. Because the value of raw and auxiliary materials is wholly incorporated in the product, this value is circulated with the product, and returns completely to the capitalist as soon as the commodity product is sold. Likewise, money laid out in wages reappears in the value of the product and circulates with it. (Surplus-value is irrelevant in the present context, for Marx is concerned with the mode of circulation of components of advanced capital.) For this reason, raw and auxiliary materials, and labor-power comprise circulating capital.

In contrast, because the value of instruments of labor is spread over the products of many production periods, only part of their value circulates with the product of a single such period. Part of their value, then, remains (is fixed) in the sphere of production, and, for this reason, instruments of labor constitute fixed capital. The several, parallel distinctions applied to the elements of productive capital are shown in Figure 3.

**Figure 3. Components of Productive Capital**

<table>
<thead>
<tr>
<th>Role in the Labour Process</th>
<th>Instruments of Labour</th>
<th>Raw Materials</th>
<th>Auxiliary Materials</th>
<th>Labour Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role in Value Creation</td>
<td>Constant Capital</td>
<td></td>
<td></td>
<td>Variable Capital</td>
</tr>
<tr>
<td>Mode of Circulation</td>
<td>Fixed Capital</td>
<td>Circulating Capital</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The distinction between fixed and circulating capital is based solely on the manner in which the parts of productive capital circulate. If, therefore, certain components of productive capital invested in raw materials are not wholly consumed in one production period (Marx employs here the example of fertilizer used in agriculture), these too count as fixed capital. Likewise, if a tool is completely used up in a single production period, it represents circulating capital. Note that circulating capital is a variety of productive capital, and, as such, must be distinguished from capital in the sphere of circulation, that is, from money capital and commodity capital.

The money obtained for circulating capital upon the sale of the product is immediately reinvested in new elements of circulating capital, to be used in the next production period. That portion of the value of fixed capital that is circulated with the product, in contrast, is kept in money form, is hoarded until the fixed capital must be replaced in its entirety.

Marx mentions that this account of the replacement of fixed capital is a simplification, because instruments of labor may, in reality, be replaced by components. Moreover, instruments of labor must be maintained and repaired. Although he discusses certain analytic difficulties, Marx treats capital expended in normal repair and maintenance as a type of circulating capital, to the extent that this capital regularly returns to the capitalist with the sale of the product and must be reinvested in continued repair and maintenance.

Chapter 9: The Aggregate Turnover of Advanced Capital

Cycles of Turnover

"The aggregate turnover of an advanced capital is the average turnover of its various constituent parts." (p. 186 [262])

We have seen that different portions of advanced capital have different periods of turnover, circulating capital being turned over most quickly, and various parts of fixed capital being turned over more slowly and, generally, at different rates. The aggregate turnover of advanced capital may be represented as a weighted average of its components. As Marx points out, to render the different components comparable, it is necessary to reduce them to comparable quantities, that is, to money. Thus the development of aggregate turnover employs the circuit of money capital. We shall develop Marx's argument algebraically in order to present it more simply and compactly.
Marx's presentation may be formalized in the following manner: let $C$ represent the aggregate of advanced capital, with aggregate turnover expressed as number of turnover periods per year, $n$ (cf., Chapter 7). Let $c_1, c_2, \ldots, c_k$ represent the components of advanced capital (expressed as amounts of money), with number of annual turnovers $n_1, n_2, \ldots, n_k$, consecutively. Then, $C = c_1 + c_2 + \ldots + c_k$.

The amount of the first component of advanced capital turned over in a year is $c_1n_1$, and likewise for the other components. The aggregate capital turned over in a year is given by $c_1n_1 + c_2n_2 + \ldots + c_kn_k = C_n$.

The example presented by Marx on p. 189 [265] is summarized in Table 1.

<table>
<thead>
<tr>
<th>Component $i$</th>
<th>Advanced Capital $c_i$</th>
<th>Yearly Number of Turnovers $n_i$</th>
<th>$c_in_i$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25,000</td>
<td>1/10</td>
<td>2,500</td>
</tr>
<tr>
<td>2</td>
<td>12,500</td>
<td>1/2</td>
<td>6,250</td>
</tr>
<tr>
<td>3</td>
<td>12,500</td>
<td>2</td>
<td>25,000</td>
</tr>
<tr>
<td>Total</td>
<td>50,000</td>
<td></td>
<td>33,750</td>
</tr>
</tbody>
</table>

Here, the aggregate advanced capital is divided into three components: $C = 50,000 = c_1 + c_2 + c_3 = 25,000 + 12,500 + 12,500$. The annual turnovers of the components are stated to be $n_1 = 1/10$, $n_2 = 1/2$, and $n_3 = 2$. Thus the total amount turned over in a year is $C_n = c_1n_1 + c_2n_2 + c_3n_3 = 25,000(1/10) + 12,500(1/2) + 12,500(2) = 33,750$, and the number of turnovers for the aggregate advanced capital is $n = C_n/C = 33,750/50,000 = 0.675$. That is, a little more than two-thirds of the aggregate advanced capital is turned over in a year, or, put alternatively, the whole of the advanced capital is turned over in $1/n = 1/0.675 = 1.48$ (about one and one-half) years.

Marx points out that although the durability of fixed capital tends to increase with advances in technology, the development of capitalist production also causes elements of fixed capital to become outmoded -- a process that he terms "moral depreciation." The end of an economic crisis is marked by large and general investments in new elements of fixed capital, providing a "material basis" for the business cycle. Crises,
therefore, play a role in the physical as well as in the social restructuring of capital, a process described in Volume I.

Chapter 10: Theories of Fixed and Circulating Capital
The Physiocrats and Adam Smith

"Political Economy subsequently went still farther by holding fast not to the antithesis between variable and constant capital but to the antithesis between fixed and circulating capital as the essential and sole delimitation." (p. 204 [278])

In this and the next chapter, Marx uses the material developed in Chapter 8 to examine and criticize the conceptions of fixed and circulating capital present in the work of other economists. Although these critiques are not central to the exposition of Volume II of Capital, they are of interest, for Marx reviews and illustrates his theory, and these sections help to place his contribution in its proper historical and intellectual context. Chapter 10 is devoted to an examination of the work of the physiocrats and of Adam Smith. Marx's textual analysis is quite detailed, and we shall merely outline the main points of his argument here.

The physiocrats were 18th Century French economists who maintained that all new value is created by nature in agricultural production. Quesnay, and the other physiocrats, were particularly interested in articulating the connections among the various parts of the economy and, therefore, made substantial contributions to an understanding of reproduction. Marx argues that the physiocrats correctly distinguished between fixed and circulating capital as components of productive capital, although their analysis was largely limited to agriculture. In Quesnay's work, fixed capital is called avances primitives (original, or basic, investment) and circulating capital is termed avances annuelles (yearly investment). The yearly period for circulating capital corresponds, of course, to the annual cycle of reproduction in agriculture.

Adam Smith's distinction between fixed and circulating capital is confused in a variety of ways. The primary confusion, upon which others are based, is the failure to distinguish circulating capital, as a component of productive capital, from capital in the sphere of circulation, that is, from commodity capital (and money capital). Smith further confuses analysis at the level of an individual capital with analysis at the level of social reproduction as a whole. Thus, he fails to realize that one capitalist's commodity capital can serve as means of production for another capitalist. As commodity capital, these articles are in the sphere of circulation; when they enter the sphere of production they
become fixed or circulating capital depending upon their role in the productive process. Indeed, commodity capital also can pass into individual consumption after it is sold.

According to the physiocrats, labor creates no new value. The value of the means of subsistence of the worker, reflected in the wage, is merely transferred to the product along with the value of the means of production. Thus, the distinction between constant and variable capital is fundamentally at odds with the physiocratic theory of value creation. Adam Smith, however, adhered generally if not consistently to the labor theory of value. By adopting the physiocrat's conception of the laborer's means of subsistence as a component of productive capital, Smith submerges the distinction between constant and variable capital beneath that between fixed and circulating capital. He therefore obscures the unique contribution of variable capital to the production of surplus-value. This is the most serious consequence of Smith's mistaken analysis of fixed and circulating capital.

Chapter 11: Theories of Fixed and Circulating Capital

Ricardo

"The part of capital laid out for wages is no longer in the least distinguished by bourgeois Political Economy from the part of capital laid out for raw materials . . . Thereby the basis for an understanding of the real movement of capitalist production, and hence of capitalist exploitation is buried at one stroke." (p. 223 [297])

David Ricardo follows Adam Smith in confounding the distinction between fixed and circulating capital with that between constant and variable capital. In his discussion of fixed and circulating capital, Ricardo identifies fixed capital with instruments of labor and circulating capital with variable capital. The circulating portion of constant capital is wholly ignored. This, according to Marx, reflects Ricardo's "logical instinct," for to class constant circulating capital with variable capital when the issue is the self-expansion of value (i.e., the substance of the constantcapital/variable-capital distinction) is to commit a grave error.

Economists following Ricardo commit precisely this error, which, for Marx is the most serious result of failing to understand properly the basis for the definition of fixed and circulating capital. By equating variable capital with circulating capital, and, therefore, defining variable capital according to the way it circulates, rather than by its unique role as creator of value in the process of production, the source of new value (and of surplus-value) is obscured. Of course, for the bourgeois apologist, this is a self-serving error, an error which leads to the physiocratic notion that the value of the worker's subsistence is
transferred to the product in the same manner as the value of constant capital. Note that Marx is more critical of this idea in the work of Ricardo and Smith than in the work of the physiocrats, for treating subsistence as value transferred to the product is consistent with physiocratic value theory and inconsistent with the labor theory of value propounded by Smith and Ricardo.

Marx concisely summarizes the consequences of Smith's confused treatment of fixed and circulating capital at the end of the chapter (p. 231 [304-305]).

**Chapter 12: The Working Period**

"[W]hen we speak of a working period we mean the number of connected working-days required in a certain branch of industry for the manufacture of a finished product." (p. 234 [308])

Different products require labor processes of varying duration to produce finished commodities ready for market. The length of the labor process required to produce a finished product is termed the working period. Marx uses the spinning of cotton yarn as an example of a commodity with a brief working period, for the product is ready for sale at short intervals; he uses the production of railroad locomotives as an illustration of a commodity with a very long working period.

Even when other factors (e.g., the proportions of fixed and circulating capital) are held constant, the length of the working period affects the capitalist's outlay for circulating capital. The amount of fixed capital advanced, however, is not affected by variations in the length of the working period. When the working period is long, the capitalist must continue to advance circulating capital for wages and for raw materials until the commodity is finished and sold, at which point the circulating capital returns in money form. Fixed capital, by definition, is advanced for more than one working period. With a long working period, therefore, the capitalist needs to advance no more fixed capital, although the wear and tear on fixed capital is recovered only when the product is finished and sold.

Because the required outlay of circulating capital depends upon the length of the working period, it is in the capitalist's interest to reduce this period. Increases in the productivity of labor (brought about, for example, by institution of a division of labor in the workplace, or by improving the instruments of labor) serve to decrease the working period. Often such a decrease is achieved at the expense of increased outlay for fixed capital (e.g., for machinery).
The length of the working period may also be decreased simply by increasing the scale of production; for example, twice as many workers may harvest a field in half the time. Here a general increase in the size of advanced capital is required.

**Chapter 13: The Time of Production**

"In all these cases therefore the production time of the advanced capital consists of two periods: one period during which the capital is engaged in the labor-process and a second period during which its form of existence -- that of an unfinished product -- is abandoned to the sway of natural processes, without being at that time in the labor-process." (p. 243 [316-317])

The working period, discussed in the previous chapter, is but one component of the time of production, that is, of the time during which industrial capital remains in the sphere of production. In many cases, the productive process continues while the labor process is interrupted, as when the subject of labor is given over to the activity of natural forces. Some of the most obvious examples of such an interruption of the labor process occur in agriculture, and Marx draws many of his illustrations for the present chapter from this sector of production.

Towards the end of the chapter, Marx briefly considers the necessity of maintaining a supply of potential productive capital, a necessity which also increases the time during which circulating capital remains in the sphere of production. He notes that failure to distinguish clearly between production time and working time (during which labor creates value) can lead to "misapplication of the labor theory of value."

**Chapter 14: The Time of Circulation**

"One of the sections of the time of circulation -- relatively the most decisive -consists of the time of selling, the period during which capital exists in the state of commodity-capital . . . . [T]he second stage of the time of circulation, the buying time [is] that period in which capital is reconverted from the money-form into the elements of productive capital."(pp. 252, 257 [326, 331])

Although Chapter 14 has the same title as Chapter 5, and though both chapters deal with the metamorphoses of capital in the sphere of circulation, each chapter has a different
focus. In the earlier chapter, Marx was primarily concerned with value relations; in the present chapter, he is chiefly concerned with the effect of the process of circulation on the turnover time of industrial capital.

Turnover time, we know, consists of production time and circulation time. Circulation time, in turn, consists of the times of sale and purchase: the time during which industrial capital changes its form in the sphere of circulation, as commodity capital is exchanged for money capital, which purchases new elements of productive capital.

The time of circulation is different in different industries, but it also varies among producers in a given industry, partly fortuitously as a function of market forces, and partly as a function of systematic factors such as the proximity of markets. Transportation from the place of production to the market, then, is one component of selling time. Likewise, in the absence of a developed credit system, the money acquired by sale takes time to return to the producer. Marx emphasizes the fact that part of an industrial capital is in each of its several forms at any point in time. Part, therefore, exists continually in the form of money capital.

Considerations arising from the sphere of circulation can also exert a reactive effect on the sphere of production. For example, the necessity of filling large orders may increase the working period and, hence, the turnover time, even if the commodity produced is by its nature capable of being sold in smaller quantities.

Chapter 15: Effect of the Time of Turnover on the Magnitude of Advanced Capital

"The economists, who as a general rule have nothing clear to say in reference to the mechanism of the turnover, always overlook this main point, to wit, that only a part' of the industrial capital can actually be engaged in the process of production if production is to proceed uninterruptedly. While one part is in the period of production, another must always be in the period of circulation." (p. 270 [342])

In this chapter, Marx demonstrates that: (1) because the turnover of capital includes a period of circulation, an additional advance of circulating capital is required for production to continue during the time of circulation; and (2) during its turnover, circulating capital frequently exists in money form, waiting to be exchanged for labor-power, raw materials, and auxiliary materials. As Engels notes near the end of the chapter (pp. 287-289 [359-360]), Marx's detailed examination of the process of turnover is needlessly complex, and, indeed, often obscures the fundamental points that Marx wishes to make. We shall describe the essential aspects of the process.
Suppose that the time of production of a particular capital is five weeks, and that each week $100 of circulating capital must be advanced for production (to purchase labor-power, raw and auxiliary materials). If the time of circulation were zero, a circulating capital of $500 would be required by the capitalist. For each week of the time of circulation, an additional $100 is required so that production may continue.

If the period of circulation is equal to that of production (five weeks), then an additional $500 is required, and the process of turnover may be diagramed as in Figure 4.

**Figure 4. Periods of Circulation and Production Equal**

Over the first 10 weeks, a circulating capital of $1000 is advanced; at the end of the tenth week, and every five weeks thereafter, $500 returns from the sphere of circulation, permitting production to continue without an additional outlay of capital.

The situation is fundamentally unchanged if the periods of production and circulation are of unequal lengths. Suppose, for example, that $100 of circulating capital is required per week, that the period of production is five weeks, and that the time of circulation is four weeks. The process of turnover is shown in Figure 5.

**Figure 5. Production Period Longer Than Circulation Period**
An initial investment of circulating capital of $900 is made over the first nine weeks; at the end of the ninth week, and every five weeks thereafter, $500 returns from the sphere of circulation, permitting production to continue.

Similar results obtain if the period of circulation exceeds the time of production. Again suppose that $100 circulating capital is required each week, but that the period of production is four weeks and that of circulation five weeks, as shown in Figure 6.

**Figure 6. Production Period Shorter Than Circulation Period**

Here, an initial investment of $900 circulating capital is needed; at the end of the ninth week and every four weeks thereafter, $400 returns from circulation.

In each of these cases, the money returning from circulation covers the investment of circulating capital required for the next production period; this is sensible since the returning money is just the converted form of the circulating capital advanced for an earlier production period. The returning money capital remains for a longer or shorter time in money form while it is gradually exchanged for new elements of circulating productive capital.

Because Marx is interested in examining the turnover of circulating capital here, he ignores fixed capital and surplus-value. Of course, when the commodity product of a production period is sold, the capitalist realizes surplus-value and wear and tear of fixed capital along with the value of circulating capital embodied in the product.

At the end of the chapter, Marx considers the effects of several sorts of changes on the turnover of circulating capital. To summarize briefly: if the period of circulation is curtailed, a smaller amount of circulating capital is required to keep production continuous. The money capital thus “freed” may be employed to increase the scale of production, or may be invested elsewhere. If, alternatively, the time of circulation
increases, an additional investment of circulating capital is required if the scale of production is not to decrease.

If the price of raw or auxiliary materials changes, the amount of money required for circulating capital changes as a consequence. Thus, a decrease in the price of materials frees capital for other employment, while an increase in material prices requires additional investment.

The effect of a change in price of the commodity product depends both on the direction of the change and upon its cause. A fall in price results in a loss to the capitalist and a rise in price results in a gain. Whether the money lost must be covered by additional investment (in the case of a rise in price, whether the money gained is needed to continue production on its previous scale) is dependent upon whether the change in price reflects a permanent condition or a temporary market fluctuation. For example, if the gain realized as a consequence of an increase in price is due to permanently increased raw material costs, the money gained is needed to cover these increased costs.

Chapter 16: The Turnover of Variable Capital

"Only the capital actually employed in the labor-process produces surplus-value and to it apply all laws relating to surplus value, including therefore the law according to which the quantity of surplus-value, its rate being given, is determined by the relative magnitude of the variable capital." (p. 301 [373])

In the previous chapter, Marx investigated the turnover of circulating capital. Hence, he combined variable capital with the constant part of circulating capital, and he ignored fixed capital and surplus-value. Consonant with his interest in examining the effect of turnover upon the value expansion of circulating capital, Marx focuses his attention in the present chapter on the turnover of variable capital and on the surplus-value which variable capital engenders.

The turnover of circulating capital as a whole was treated in the previous chapter. As part of the circulating capital, variable capital is advanced for the period of turnover, comprising both the production period and the period of circulation. At the end of the period of circulation, variable capital employed in the previous production period returns to the capitalist along with the surplus-value it produced (and along with circulating constant capital used in production, and the wear and tear of fixed capital for the production period, though these latter two value components are irrelevant in the present context).
Marx here differentiates between (1) the real rate of surplus-value, the ratio of surplus-value produced in a given period of time (say, one turnover period) to the variable capital employed during that time, and (2) the annual, rate of surplus-value, the ratio of surplus-value produced in a year to the amount of variable capital advanced for production in that year. The key distinction is the difference between capital employed and capital advanced.

Variable capital employed in production during a particular period of time is the amount of functioning labor-power purchased by the capitalist during that time. Using Marx's example (but with dollars rather than pounds as the monetary unit), if a capitalist operates an enterprise with a weekly wage bill of $1000, in a 50 week year the capitalist employs a variable capital of $50,000. Note that for a given scale of production (i.e., here, a given weekly variable capital), capital employed is not dependent upon the period of turnover.

Variable capital advanced for production is the amount of wages the capitalist must lay out prior to selling the commodity product, and thereby replenishing the fund for variable capital. Variable capital advanced, then, is equal to the weekly wage bill times the number of weeks comprising the turnover period of variable capital. For example, if the period of turnover is five weeks, then, using the conditions of the previous illustration, variable capital advanced is $5000. Alternatively, if the variable capital has an annual turnover, variable capital advanced is $50,000 (assuming, with Marx, a 50 week year).

In symbols, the real rate of surplus-value is given by $s' = \frac{s}{v}$, where $s$ is the amount of surplus-value produced in a particular period of time and $v$ is the variable capital employed. The annual rate of surplus-value is given by $S' = \frac{s'vn}{v} = s'n = n\left(\frac{s}{v}\right)$. Here, $n$ is the number of annual turnovers of the variable capital, and the other symbols have their previous meanings. The numerator of the first expression for $S'$, that is $s'vn$, is the amount of surplus-value produced annually. Assuming a real rate of surplus-value of one (i.e., 100 per cent), the annual rates of surplus value for the two illustrations are:

(1) $S' = 1(10) = 10$ or 1000 per cent
(2) $S' = 1(1) = 1$ or 100 per cent.

A capitalist whose capital turns over quickly, who therefore produces a large quantity of surplus-value for a given initial investment (capital advanced), realizes a high annual rate of surplus-value. A capitalist whose capital turns over slowly must continue to advance variable capital (and, indeed, circulating constant capital) throughout the lengthy turnover period, and, thus, realizes a low annual rate of surplus-value. From the point of view of society (as opposed to that of the individual capitalist), the capitalist whose capital turns over slowly continually advances money to the market, withdrawing means of production and labor-power from it. The capitalist's laborers spend their wages on subsistence goods, withdrawing these from the market as well. Until the period of production is completed, however, the capitalist supplies no new commodities to the
market. The delays caused by long turnover periods can magnify imbalances in the market and therefore contribute to economic crises.

Chapter 17: The Circulation of Surplus-Value

"Indeed, paradoxical as it may appear at first sight, it is the capitalist class itself that throws the money into circulation which serves for the realisation of the surplus-value incorporated in the commodities." (p. 338 [409])

Marx's discussion of the circulation of surplus-value is wide-ranging. Although most of the chapter is devoted to demystification of the role of money in the process of reproduction, Marx touches as well upon the use of surplus-value in "original" investment, the credit system, the struggle between workers and capitalists over wages, and the capitalization of surplus-value. His treatment of simple and extended reproduction serves to introduce the topic of the last part of Volume II.

Marx begins by noting that if the turnover of capital is sufficiently rapid, surplus-value realized from early turnover periods may furnish part of the "original" capital advanced for maintenance and repair, thus decreasing the capitalist's initial investment. Moreover, the development of the credit system permits a capitalist to borrow part of the originally advanced capital from other capitalists, through intermediaries such as bankers. This borrowed capital consists of surplus-value accumulated by these other capitalists and represents latent money capital to them.

Under simple reproduction, all of surplus-value is spent as revenue by capitalists for their individual consumption. That portion of the annual product representing the value of labor-power and constant capital is reinvested, the scale of production therefore remaining unchanged. Under these circumstances, the quantity of money required for circulating the annual product is also unchanged. Because part of the money commodity wears away (here metallic money is assumed), however, this portion must be reproduced each year. For simplicity, Marx supposes that precious metals are produced within the country under consideration, although the acquisition of precious metals in foreign trade does not fundamentally change the situation: part of the annual product of one country is exchanged for money produced in another country.

In Chapter 1, Marx briefly considered the special form of the circuit of money capital in the production of the money commodity: $M\rightarrow C \ldots P \ldots M'$. Here, the outcome of the process of production is not commodity
capital which must be exchanged for money, but money itself; and one component of the product consists, as always, of surplus-value.

Under simple reproduction, capitalists producing precious metals cast their product into circulation, purchasing new means of production and labor-power, and spending for their personal consumption that portion of the product representing surplus-value. In the process, money worn away in circulation is replaced in kind. Thus, the origin of the money required to circulate the annual product of society, including the annually produced surplus-value, is not mysterious: metallic money is the product of a particular sphere of production, operating on a capitalist basis.

In value terms, however, the following problem presents itself: an individual capitalist (or the capitalist class as a whole) invests a specific amount of money capital in means of production and labor-power. This sate capitalist (or the capitalist class) at the end of the turnover period receives a greater amount of money than was initially invested, because the product sold includes surplus-value along with the value of advanced capital. Where does the additional money required for the circulation of surplus-value come from? In real terms, we already know that money is produced by the precious metals industry. But who places that money on the market in an act of exchange? The money cannot come from the working class, because its supply of money is spent for subsistence, and originates in the outlay of variable capital for wages by the capitalist class. Nor can it come from the money paid for means of production, because this is the outlay of the capitalist class that circulates constant capital.

The money that circulates, surplus-value originates in the capitalist's expenditures for personal consumption. Under simple reproduction, what the capitalist spends for consumption is precisely equal to surplus-value produced. In other words, as producers, the capitalist class advances variable and constant capital to circulation; as consumers, the same class spends surplus-value in circulation. As producers, capitalists productively consume means of production and labor-power (and indirectly provide for the personal consumption of the working class by providing the latter with wages); as consumers, capitalists personally consume subsistence and luxury goods. The nature of these relationships among production, consumption, and circulation is taken up in detail in Marx's consideration of the reproduction of the aggregate social capital, the subject of the concluding part of Volume II of Capital.

Marx frequently argues against the conception that the portion of the annual product of society going to the working class is immutable. Under simple reproduction, an increase in wages, hence a decrease in surplus-value, is reflected in increased consumption by the working class and decreased personal consumption on the part of capitalists. The size of the annual product and the volume of money required to circulate it are unchanged; the division of newly created value is, however, altered in favor of the working class. The increased demand for subsistence goods that results from a rise in wages may produce a temporary increase in the price of these goods. But the simultaneous decrease
in demand for, and price of, luxury goods will ultimately result in a shift of capital to subsistence goods producing industries, and a restoration of price equilibrium.

Likewise, the argument that a rise in wages is simply reflected in increased prices does not bear scrutiny, for if capitalists had the ability to increase prices arbitrarily without regard to value relations, and supply and demand, they would certainly do so, whether wages rise or not. At bottom, economic arguments against the possibility of real wage increases simply serve the political interests of the bourgeoisie.

Extended reproduction presents no new analytic difficulties, at least for the issues raised in this chapter. Under extended reproduction, in a particular year, we have simply a different division of the year's product: part of what under simple reproduction was spent by the capitalist class for its personal consumption, now is invested in new elements of capital. As the social product expands from year to year, a greater quantity of money is required for its circulation. This money may either be produced locally or acquired through foreign trade. Alternatively, mechanisms such as the credit system serve to decrease the need for metallic money, thus reducing the portion of society's product that covers the costs of circulation.

Part III

The Reproduction and Circulation of the Aggregate Social Capital

Chapter 18: Introduction

"But in both the first and the second Parts it was always only a question of some individual capital, of the movement of some individualised part of social capital. However the circuits of the individual capitals intertwine, presuppose and necessitate one another, and form, precisely in this interlacing, the movement of the total social capital." (p. 357 [429])

In the first two parts of Volume II of Capital, Marx investigated the processes of circulation and reproduction primarily from the point of view of an individual capital. At points, however, Marx introduced the concept of the aggregate capital of society, and he briefly considered the interrelationships among different individual capitals, between capital and labor, and between production and consumption. These topics now take center stage. In many respects, the concluding section of Volume II is the most creative.
part of the volume, and, indeed, is often considered among the most important of Marx’s contributions. It is in this part of *Capital* that Marx constructs what would today be called macroeconomic models, formal systems displaying the interrelations among the various parts of the economy.

Individual capitals taken together comprise the aggregate social capital; the circulation and reproduction of the aggregate social capital entails not only the circulation of capital itself, but also the circulation of commodities generally. Furthermore, in the analysis of social reproduction, not just production, but consumption as well must be considered. These points were touched on in Chapter 4. Labor-power is a commodity purchased by capital, but labor-power is not produced on a capitalist basis. Laborers and capitalists purchase their consumption goods from capitalists, spending wages and surplus-value derived from capital. Finally, capitalists purchase means of production from each other. All these exchanges are involved in the analysis of the circulation of the aggregate social capital, although only the last represents exchange between different functioning individual capitals.

Considered socially, as well as individually, money capital is required to set capitalist production in motion and to continue the process of reproduction. Money is required because capital must circulate: productive capital is purchased as commodities, and the product of capitalist production is sold as commodities. As was explained in the analysis of turnover, the amount of money capital required is dependent upon the scale of production, and on the length of the turnover period for which capital must be advanced.

This is not to say, however, that the amount of money capital available places absolute limits on the scope of capitalist production. Marx enumerates a number of previously considered factors here: for example, with wages fixed, labor-power may be exploited to a greater or a lesser extent. Furthermore, the use of natural materials in production may be increased without additional expenditure of capital. The employment of additional auxiliary materials may have a greater than proportional effectiveness. Similarly, elements of fixed capital may be used more effectively: although they then would wear away more quickly (i.e., their turnover would be shortened), their value would return to the capitalist more quickly as well. Natural forces, the accumulated skill of individual laborers, and the productive power of social labor are all free to the capitalist! Finally, shortening the turnover period allows a given money capital to set in motion more productive capital.

**Chapter 19: Former Presentations of the Subject**

"Now Adam Smith's first mistake consists in equating the value of the annual product to the newly produced annual value . . . . By this confusion Adam Smith spirits away the constant portion of the value of the annual product." (p. 381 [453])
Chapter 19 is devoted to criticism of other economists' treatment of the reproduction process. Although the chapter begins with a brief consideration of the physiocrats and ends with some remarks on later economists, the major part of Marx's effort is directed towards the errors and contributions of Adam Smith. The chapter is not central to the argument in Volume II of *Capital*, but it is interesting insofar as it reveals the sources of Marx's insights into the process of reproduction. In this chapter, Marx formulates the kernel of his analysis of simple reproduction.

Marx argues that the physiocrats had a fundamentally sound conception of simple reproduction, but a conception limited by the physiocratic doctrine that only the agricultural sector produces new value. Paradoxically, their concentration on agriculture permitted the physiocrats to avoid the hazard on which Adam Smith's analysis founded: an incorrect conceptualization of the role of constant capital in the reproductive process. In agriculture, part of the previous year's product (e.g., in the form of seed) stays in the hands of its producer to furnish "constant capital" for the subsequent year's productive activity. Because this portion of the annual product of society does not circulate, its role in reproduction is not obscured by the process of circulation.

Adam Smith extends the physiocrats' treatment of reproduction beyond the agricultural sector. A similar point was made in connection with Smith's analysis of fixed and circulating capital. Smith, however, perpetuates physiocratic errors by according a special status to agricultural production, and, more importantly, confuses the role of constant capital in the creation of commodity value and in the process of reproduction. This confusion does not wholly permeate Smith's analysis, for at times he points towards correct conceptions, but his work is at best inconsistent.

Smith argues that the annual product of society may be divided into three components, and, moreover, that these components are the "original sources" of all commodity value. The sources, wages, profits, and rents, represent the revenues of workers, capitalists, and landlords, consecutively. In Marx's terms, Smith's three sources of value are variable capital (i.e., wages) and surplus-value (which is divided into profit and rent, as detailed in Volume III of *Capital*). What is missing, of course, is constant capital, whose value is transferred to the product, and which, therefore, also constitutes part of commodity-value.

Smith partially rescues his analysis, reintroducing the value of constant capital by distinguishing between gross and neat (net) revenue, although even here the role of constant capital is not clearly conceived. Furthermore, Smith proceeds to argue that even if the whole of commodity value includes a component derived from constant capital, this component ultimately is "reduced" to surplus-value and wages. The argument entails successive substitution for the constant capital portion of the value of
the product: when purchased, part of the value of the constant capital originated from the labor directly expended in its production and part from means of production; these means of production also had a direct labor component; and so on. Although it is true that all value is the direct or indirect product of labor (and hence, under capitalism, of necessary and surplus labor), part of the value of any given product is transferred pre-existing value. This point is crucial to an understanding of social reproduction, for society does not start each year's production without previously fabricated means of production, nor does it consume the entirety of its annual product.

Smith's error results from failing to distinguish clearly between (1) the value of the product, and (2) newly produced value incorporated in the product. This distinction applies equally to a particular commodity product and to the annual social product. The value of the product consists of the value of constant capital, variable capital, and surplus-value. Variable capital and surplus-value represent newly produced value, while constant capital represents previously existing value, which is merely transferred to the product. In simple reproduction, all of surplus-value and wages are consumed, by capitalists and workers, respectively. At the social level, then, value equal to surplus-value and variable capital -- the annual value product -- is consumed by the capitalist and working classes. Because the part of the annual product representing constant capital is left over, this part is available to furnish means of production (i.e., real elements of constant capital) for next year's production. Thus, under the regime of simple reproduction, the value of constant capital with which annual production begins reappears at the end of the year, permitting production to continue; only the newly created value is consumed.

Smith did, however, point towards the key distinction between production of means of production (incorporating the value of the constant capital component of the annual social product), and production of articles of consumption. This insight is vitiated by Smith's elimination of constant capital, by his confusion of the processes of circulation and production, and by other errors.

Some later economists, such as Ricardo, fall prey to Smith's mistakes, while others (e.g., Ramsey) correctly criticize Smith without producing adequate positive accounts of social reproduction. Vulgar economists use Smith's analysis to argue that all of society's annual product is consumed, a conclusion that follows from Smith's errors, but which he (correctly) denied.

**Chapter 20: Simple Reproduction**

"On the assumption of simple reproduction the total value of the annually produced articles of consumption is therefore equal to the annual value-product, i.e., equal to the total value produced during the year by social labor, and this must be so, because in simple reproduction this entire value is consumed." (p. 429 [501])
Marx begins his treatment of the reproduction of the aggregate social capital with simple reproduction, the subject of the present chapter. The analysis of simple reproduction provides the point of departure for Marx's consideration of extended reproduction in the concluding chapter of Volume II. An examination of social reproduction must include not only an accounting of values, but also an analysis of how material reproduction takes place, that is, an accounting of use-values. For this reason, as mentioned at earlier points in the text, Marx employs the circuit of commodity capital for his treatment of reproduction, because this form of the circuit begins and ends with capital in the shape of particular use-values. Moreover, in treating reproduction it is necessary to show the relationship between capitalist production and the personal consumption of workers and capitalists, for part of the annual product of society is consumed.

Marx divides the annual social product into two parts: the part of the product that furnishes new means of production; and the part that serves as articles of consumption. Those spheres of production that produce new means of production are aggregated into a "department" of social production, labeled Department I. Articles of consumption are produced in Department II.

For simplicity, Marx assumes that all production takes place on a capitalist basis. Under this assumption, the value of the product in each department is the sum of the values of constant and variable capital employed in that department, together with the surplus-value produced there. Note that this analysis parallels the decomposition of the value of the product of an individual capital. Writing an equation for each department, we have the following relations:

\[
\begin{align*}
\text{Department I} & \quad C'_1 = c_1 + v_1 + s_1 \\
\text{Department II} & \quad C'_2 = c_2 + v_2 + s_2
\end{align*}
\]

The notation used here requires some explanation, for it differs somewhat from that employed by Marx. \( C' \) represents the value of the annual commodity product; \( c \) is the constant capital, employed in a year, and therefore includes constant circulating capital together with the portion of fixed capital that wears away during the year; \( v \) is variable capital advanced for wages; and \( s \) is surplus-value produced. The subscript (1 or 2) attached to each symbol represents the department. This notation is more modern and less unwieldy than Marx's, which uses a Roman numeral for the department, sub-
scripted by a value component. For example, Marx symbolizes the constant capital in Department II by IIc, while we employ c2 for the same quantity.

Marx uses the following example throughout the chapter:

**Department I:**

\[ C_1' = c_1 + v_1 + s_1 \]

\[ 6000 = 4000 + 1000 + 1000 \]

**Department II:**

\[ C_2' = c_2 + v_2 + s_2 \]

\[ 3000 = 2000 + 500 + 500 \]

Thus, in this example, two-thirds (6000/9000) of society's annual product is absorbed in producing new means of production, and one-third (3000/9000) in producing articles of consumption. The value composition of capital (c/v) is the same in both departments: 4/1 = 4000/1000 = 2000/500. The rate of surplus-value (s/v) is also the same in both departments, and is 100 per cent. None of these properties of the example is fundamental, but they make for a clear and simple illustration.

Under the system of simple reproduction, the scale of production is unchanged from year to year. Thus, all of surplus-value is spent by capitalists far articles of consumption. The demand for new means of production, then, is equal to the constant capital used in both departments, while the demand for articles of consumption is equal to the variable capital and surplus-value in both departments, representing the revenue of workers and capitalists, respectively. We have the supply and demand value relations shown in Table 2.

**Table 2. Supply and Demand in the Two-Department Model**

<table>
<thead>
<tr>
<th></th>
<th>Supply</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Department I</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Means of Production</td>
<td>( C_1' = c_1 + v_1 + s_1 )</td>
<td>( c_1 + c_2 )</td>
</tr>
<tr>
<td><strong>Department II</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Articles of Consumption</td>
<td>( C_2' = c_2 + v_2 + s_2 )</td>
<td>( v_1 + v_2 + s_1 + s_2 )</td>
</tr>
</tbody>
</table>

If the system is in equilibrium, supply and demand must balance. Table 3 verifies that this is the case for Marx's example.
Table 3. Balancing of Supply and Demand in Marx's Example

<table>
<thead>
<tr>
<th>Supply</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Department I</strong></td>
<td>$C'_1 = c_1 + c_2$</td>
</tr>
<tr>
<td>6000</td>
<td>4000 + 2000</td>
</tr>
<tr>
<td><strong>Department II</strong></td>
<td>$C'_2 = v_1 + v_2 + s_1 + s_2$</td>
</tr>
<tr>
<td>3000</td>
<td>1000 + 500 + 1000 + 500</td>
</tr>
</tbody>
</table>

More generally, by equating supply to demand in either department, we may derive the fundamental equilibrium condition for simple reproduction: $c_2 = v_1 + s_1$. In Department I, we have $c_1 + v_1 + s_1 = c_1 + c_2$, which yields the equilibrium condition by canceling $c_1$ from the two sides of the equation; likewise, in Department II, we get the equilibrium condition by canceling $v_2 + s_2$ from both sides of $c_2 + v_2 + s_2 = v_1 + v_2 + s_1 + s_2$. For Marx's example, we have $c_2 = 2000 = v_1 + s_1 = 1000 + 1000$. In words: the expenditures of Department II for means of production ($c_2$) must equal the expenditures of Department I workers ($v_1$) and capitalists ($s_1$) for articles of consumption. Although we have derived this equilibrium condition formally by equating supply to demand, we shall see presently that the condition makes intuitive sense when we consider the meaning of simple reproduction.

Social reproduction entails a sequence of exchanges between workers and capitalists, among capitalists in their capacities as producers and consumers, between and within the two departments of social production. These exchanges of commodities and money are the subject of much of Marx's exposition of the process of simple reproduction. We shall deal with them more briefly here. Commodity flows in the two-department model are shown in Figure 7.

Figure 7. Commodity Flows in the Two-Department Model of Simple Reproduction
The actors in the diagram the collective capitalists and workers in the departments. Each arrow represents a commodity exchange (more properly, a class of exchanges) and is labeled with the value of commodities exchanged. The direction of the arrow represents the direction of the exchange: from seller to buyer. Money (of equal value) flows in the opposite direction. Thus, for example, the arrow from workers in Department I to capitalists in the same department represents the sale of these workers' labor-power to their employers. As a consequence of this transaction, capitalists in Department I acquire labor-power of value $v_1$, and workers in Department I receive value $v_1$ in the form of money, that is, wages. With their wages, workers in Department I purchase consumption goods of value $v_1$ from capitalists in Department II; this exchange is shown as the arrow from capitalists II to workers I. Capitalists and workers in both departments purchase their consumption goods from the capitalists of Department II. Capitalists in both departments buy their means of production from the capitalists of Department I. Workers in each department sell their labor-power to the capitalists of the same department.

A word should be said about the arrow from capitalists in Department I to themselves: at first glance this relation seems paradoxical, until we recall that capitalists producing new means of production themselves employ means of production, which must be bought from other capitalists in their department. (In certain special circumstances capitalists may in fact employ part of their own product to furnish new means of production - e.g., seed in agriculture -- but these are exceptional cases.) A similar comment applies to the self-directed arrow for capitalists in Department II: they purchase articles of consumption from each other.
Recall the equilibrium condition for simple reproduction: \( c_2 = v_1 + s_1 \). In terms of commodity flows, this condition implies a balanced exchange between departments. \( v_1 + s_1 \) is the value of Department II sales of consumption goods to Department I; \( c_2 \) is the value of Department I sales of means of production to Department II. If the exchange between departments were unbalanced, there would be a drain of value from one department to the other, making the system of reproduction unstable.

A point that is made with great clarity in Marx's two department model of reproduction is that part of society's annual product is not consumed, but rather furnishes next year's means of production. Indeed, in Marx's example, two-thirds of society's annual output consists of new means of production. (Recall that this is precisely the point that Smith failed to grasp clearly.) Under simple reproduction, however, all newly created value must be consumed. Row, then, is it possible for a portion of society's labor to be directed not towards the production of articles of consumption, but rather to the production of new means of production?

To solve this apparent problem, Marx appeals to the (previously introduced) distinction between the annual value product and the value of the annual product. The annual value product consists of newly created value in both departments: \( v_1 + v_2 + s_1 + s_2 \). The value of the annual product, \( C'_1 + C'_2 \), contains as well the constant capital employed in both departments, that is, \( c_1 + c_2 \). Thus, part of the value of the annual product is contributed by means of production that themselves are not produced in the current year, but were part of the previous year's product. In the same way, part of the current year's product is incorporated in means of production to be used next year. For simple reproduction to take place, the value of new means of production, produced during and left at the end of the year, must be the same as the value of old means of production available at the beginning of the year and used during the year. Only value equal to newly created value in both departments can (and must) be consumed. Thus, the total of newly created value from both departments (i.e., \( v_1 + s_1 + v_2 + s_2 \)) must be equal to the value of consumption goods, the production of Department II (\( C'_2 = c_2 + v_2 + s_2 \)). Equating these two quantities gives the now familiar equilibrium condition. It is the pre-existing value embodied in means of production available at the beginning of the year, then, that makes it possible for a portion of society's product (2/3, in the example) to be incorporated in new means of production, at the same time that all newly created value is consumed.

Marx traces in detail how money mediates the exchanges by which the aggregate social capital circulates. This analysis does not alter the conclusions presented thus far. All of the money required to circulate the annual social product is advanced, in one form or another, by the capitalist class: to purchase means of production (constant capital), labor-power (variable capital), and capitalists' consumption goods. This money returns to the capitalist class when the commodity product is sold, for this product includes the value of constant and variable capital together with the surplus-value which finances the capitalists' personal consumption.
The routes by which money returns to the capitalists who advanced it are often indirect, even at the aggregate level of the two departments. For example, capitalists in Department I advance money in the form of wages to workers in the same department; these workers purchase articles of consumption from the capitalists of Department II who, in turn, buy means of production from the capitalists of Department I. As was pointed out above, money flows maybe discerned by reading the commodity-flow diagram backwards.

The actual quantity of money required to circulate the annual product depends not only upon the size of this product, but also upon the rapidity of circulation: after all, the aggregate annual product does not circulate wholly at the end of the year. To the extent that money wears away in the sphere of circulation, it is replaced by new production of the money commodity (as explained, for example, in Chapter 1).

For part of his analysis of simple reproduction, Marx divides Department II (the production of articles of consumption) into two sub-departments: Department IIa, which produces necessities consumed by both workers and capitalists; and Department IIb, which produces luxury goods consumed only by capitalists. For simplicity, Marx assumes that capitalists in all departments divide their consumption into necessities and luxuries in the same proportions: suppose that k represents the proportion of capitalists' revenue spent for necessities and the remainder, 1 - k, the proportion spent for luxuries. (Marx does not employ this notation, but k is implicitly 3/5 in his example.)

The "three department" model is represented by the supply and demand equations shown in Table 4:

**Table 4. Supply and Demand in the Three-Department Model**

<table>
<thead>
<tr>
<th>Department</th>
<th>Supply</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>I: Means of Production</td>
<td>( C'<em>1 = c_1 + v_1 + s_1 ) = ( c_1 + c</em>{2a} + c_{2b} )</td>
<td></td>
</tr>
<tr>
<td>IIa: Necessities</td>
<td>( C'<em>{2a} = c</em>{2a} + v_{2a} + \frac{v_1 + v_{2a} + v_{2b} + k(s_1 + s_{2a} + s_{2b})}{s_{2a}} )</td>
<td></td>
</tr>
<tr>
<td>IIb: Luxuries</td>
<td>( C'<em>{2b} = c</em>{2b} + v_{2b} + \frac{(1 - k)(s_1 + s_{2a} + s_{2b})}{s_{2b}} )</td>
<td></td>
</tr>
</tbody>
</table>

The supply and demand relations for Marx's illustration appear in Table 5.
Table 5. Balancing of Supply and Demand in Marx’s Example

<table>
<thead>
<tr>
<th>Department</th>
<th>Supply</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>$C'<em>1 = c_1 + v_1 + s_1 = c_1 + c</em>{2a} + c_{2b}$</td>
<td>$6000 4000 4000 1000 4000 1600 400$</td>
</tr>
<tr>
<td>IIa</td>
<td>$C'<em>{2a} = c</em>{2a} + v_{2a} + s_{2a} = v_1 + v_{2a} + v_{2b} + k(s_1 + s_2a + s_{2b})$</td>
<td>$2400 1600 400 400 1000 400 100 0.6 1000 400 100$</td>
</tr>
<tr>
<td>IIb</td>
<td>$C'<em>{2b} = c</em>{2b} + v_{2b} + s_{2b} = (1-k)(s_1 + s_{2a} + s_{2b})$</td>
<td>$600 400 100 100 0.4 1000 400 100$</td>
</tr>
</tbody>
</table>

Note that for equilibrium to obtain, not only must there be balanced exchange between Departments I and II ($c_2 = c_{2a} + c_{2b} = v_1 + s_1$), but as well, there must be a division of production of articles of consumption into necessities and luxuries that reflects capitalists' expenditures for these goods. The more complex commodity flows for the three department model are shown in Figure 8. As before, money and commodities flow in opposite directions.

Figure 8. Commodity Flows in the Three-Department Model of Simple Reproduction

Marx takes pains to point out that the reproduction of the aggregate social capital includes the reproduction of the class relation between workers and capitalists. Workers exchange their labor-power for wages, with which they purchase articles of consumption. These consumption goods, representing a portion of the annual product created by the workers' own labor, serve to reproduce the workers' labor-power. The
working class depends for its existence on the continued sale of its labor-power to the capitalist class.

Marx notes, in this context, that it is inaccurate to say that capitalists exchange variable capital for labor-power (although this expression is sometimes used in a "shorthand" fashion). Rather, latent variable capital in the form of money is exchanged for labor-power, which functions as variable capital in the process of production. The capital remains in the capitalist's hands; it merely changes its form. In the hands of the worker, money wages simply represent (that is, are exchanged for) the worker's subsistence; wages are not capital for the worker, whose exchanges (LP--M--C) have the form of the simple circulation of commodities.

In most of his consideration of simple reproduction, Marx ignores the special characteristics of fixed capital, stating simply that only the part of fixed capital that wears away during the year contributes value to the annual commodity-product. In actuality, some of fixed capital expires (that is, completes its useful life) during a given year, while the remainder continues to function. Only the fixed capital that expires is replaced out of the annual product. Fixed capital that is not wholly worn away during the year, however, yields a money return to the capitalist, even though it is not replaced in kind in that year. This money, as was explained in the section on turnover, is hoarded against the day when the fixed capital must be replaced.

For simple reproduction to take place, the money that is drawn from circulation for hoard formation must equal the money re-entering circulation to replace fixed capital expiring during the year, money which partially represents previous years' hoards. Moreover, Marx argues, because simple reproduction means an identical scale of production from one year to the next, and because, therefore, identical circulating capital is required from year to year, the amount of fixed capital wearing away annually cannot change. Marx regards this as an unrealistic requirement.

Chapter 21: Accumulation and Reproduction on an Extended Scale

"[R]eproduction on an enlarged scale . . . has nothing to do with the absolute volume of the product, . . . for a given quantity of commodities it implies merely a different arrangement or a different definition of the functions of the various elements of a given product . . . " (p.510 [582])

At several earlier points in Capital, Marx dealt with extended reproduction -- capitalization of a portion of surplus-value -- from the perspective of an individual capital. The analysis of extended reproduction grows more complex when undertaken
from the standpoint of the aggregate social capital. It becomes necessary to account not only for the individual capitalist's ability to increase the scale of production (through the accumulation of potential money capital), but as well for the ability of the economy as a whole to sustain an increase by supplying new real elements of productive capital ("virtually additional productive capital").

Marx's great achievement in the concluding chapter of Volume II is his demonstration of the possibility of extended reproduction on an economy-wide basis. Indeed, this demonstration is the primary purpose of the chapter. In the course of his investigation, Marx lays the foundation for further formal study of capitalist growth. Yet, his exposition in this chapter is difficult to follow, largely because results are expressed in the form of numerical examples, without general (i.e., algebraic) statement. To render Marx's treatment of extended reproduction more transparent, we shall formalize his presentation, at the same time adhering closely to his formulation. (A little of this sort of formalization was done in the summary of the preceding chapter.) Formalization is clearly in the spirit of Marx's *Capital*, for Marx was a great pioneer in the application of mathematics to the study of economy and society.

Marx develops his analysis of extended reproduction in the context of the two department model: as before, means of production are produced in Department I, and articles of consumption in Department II. Because under extended reproduction the scale of production increases from year to year, we write the basic value equations of the two department model in the following format:

\[
\begin{align*}
\text{Department I} & : C'_{1t} = c_{1t} + v_{1t} + s_{1t} \\
\text{Department II} & : C'_{2t} = c_{2t} + v_{2t} + s_{2t}
\end{align*}
\]

The symbols \( C' \), \( c \), \( v \), and \( s \) have their previous meanings, but each now has a double subscript: the first subscript (1 or 2) gives the department; the second subscript, \( t \), indicates the year (and takes on the value 1 for the first year, 2 for the second, 3 for the third, etc.).

Under extended reproduction, part of the surplus-value produced in a given year is capitalized; that is, rather than being spent in its entirety as revenue for the capitalists' personal consumption, a portion of surplus-value is invested in new elements of productive capital (new means of production and labor-power). Let \( p_1 \) represent the rate of capitalization of surplus-value in Department I -- the proportion of surplus-value that capitalists in Department I invest in new productive capital. \( p_1 \), then, must be between zero and one: if it is equal to zero, we have simple reproduction; it cannot quite reach one, for then the capitalist class would starve, that is, consume nothing. Similarly, \( p_2 \) represents the rate of capitalization of surplus-value in Department II. \( p_1 \) and \( p_2 \) are not necessarily identical; indeed, we shall see that they generally must be different, given
Marx's formulation of the extended reproduction problem. (This property should be counted as a weakness of Marx's formulation.) Note, further, that we have not attached a time subscript to $p_1$ and $p_2$. This is because, in Marx's formulation, $p_1$ and $p_2$ stabilize; the stable values of $p_1$ and $p_2$ for his example will be derived below.

When surplus-value is capitalized, part of it is invested as constant capital in new material means of production, and the rest as variable capital in new labor-power. How capitalized surplus-value is divided between these two components depends on the value composition of capital. Marx usually expresses the value composition of capital as a ratio, $c/v$. Here, we shall express the value composition as the proportion of constant capital, $k = c/(c + v)$, which conveys the same information, but is in a more convenient mathematical form for present purposes. In Department I, we have $k_1 = c_1/(c_1 + v_1)$, and in Department II, $k_2 = c_2/(c_2 + v_2)$. Note that we have omitted the time subscript here, to emphasize the point that although the amounts of constant and variable capital change over time, their proportions do not change in Marx's formal treatment of extended reproduction. It is, perhaps, unnecessary to add that the assumption of an unchanging value composition of capital, is a simplification that Marx did not regard as realistic. We should keep in mind Marx's main purpose in the present chapter: to demonstrate the logical possibility of extended reproduction, and to explore some of its properties, not to describe in detail the actual course of capital accumulation. Note, furthermore, that Marx permits a different composition of capital in the two departments; in his first illustration these quantities in fact differ, while in the second illustration they are identical.

We shall also find it convenient to have symbols for the rate of profit in each department. Marx's illustrations assume that the rate of surplus-value ($s/v$) is the same in the two departments. Because the compositions of capital may differ, however, the rates of profit $r = s/(c + v)$ may differ as well. We shall let $r_1$ represent the rate of profit in Department I, and $r_2$ that in. Department II. The various symbols are summarized in Table 6.

<table>
<thead>
<tr>
<th>Table 6. Summary of Symbols Employed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Department I</strong></td>
</tr>
<tr>
<td>Value of Product, Year $t$</td>
</tr>
<tr>
<td>Constant Capital, Year $t$</td>
</tr>
<tr>
<td>Variable Capital, Year $t$</td>
</tr>
</tbody>
</table>
Surplus-Value, Year t

Capitalization Rate

Composition of Capital

Rate of Profit

When accumulation of capital takes place, as we have mentioned, part of the surplus-value is used to purchase additional elements of constant and variable capital. In Department I, for example, in year t, $p_1s_{1t}$ is capitalized for the next year; of this newly capitalized surplus-value, $k_1p_1s_{1t}$ goes to augment constant capital, and the remainder, $(1 - k_1)p_1s_{1t}$, to variable capital. Similar relations hold in Department II. Thus we have the following results (where, e.g., $c_{1,t+1}$ is the constant capital in Department I in year $t + 1$):

Department I

\[
\begin{align*}
  c_{1,t+1} &= c_{1t} + k_1p_1s_{1t} \\
  v_{1,t+1} &= v_{1t} + (1 - k_1)p_1s_{1t}
\end{align*}
\]

Department II

\[
\begin{align*}
  c_{2,t+1} &= c_{2t} + k_2p_2s_{2t} \\
  v_{2,t+1} &= v_{2t} + (1 - k_2)p_2s_{2t}
\end{align*}
\]

The relation of year $t$'s product in Department I to capital advanced in this department in year $t + 1$ is shown schematically in Figure 9.

Figure 9. Capital Accumulation in Department I
A similar figure could be drawn for Department II.

For accumulation to be possible, next year’s demand for additional constant capital must be met out of the present year’s production of Department I. Of course, more labor-power is required as well, and Marx dealt at length with this topic in his discussion of the general law of capitalist accumulation in Volume I (Chapter 25); this new labor-power requires additional subsistence goods from Department II. Further, since not all surplus-value is expended as revenue for the capitalists’ consumption, the demand for Department II’s output is correspondingly reduced (in comparison with simple reproduction). For instance, surplus-value spent by Department I capitalists for their own consumption is \( (1 - p_1)s_1 \). We have, then, the supply and demand relations shown in Table 7.

### Table 7. Supply and Demand in the Model for Extended Reproduction

<table>
<thead>
<tr>
<th>Department</th>
<th>Supply</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>( C'<em>{1t} = c</em>{1t} + v_{1t} + s_{1t} )</td>
<td>( c_{1,t+1} + c_{2,t+1} = c_{1t} + k_1p_1s_{1t} + c_{2t} + k_2p_2s_{2t} )</td>
</tr>
<tr>
<td>II</td>
<td>( C'<em>{2t} = c</em>{2t} + v_{2t} + s_{2t} )</td>
<td>( v_{1,t+1} + v_{2,t+1} + (1 - p_1)s_{1t} + (1 - p_2)s_{2t} = v_{1t} + v_{2t} + (1 - k_1p_1)s_{1t} + (1 - k_2p_2)s_{2t} ) [after simplification]</td>
</tr>
</tbody>
</table>

By setting supply equal to demand in either department, we obtain the fundamental equilibrium condition of Marx’s extended reproduction model, namely: \( v_{1t} + s_{1t} = c_{2t} + k_1p_1s_{1t} + k_2p_2s_{2t} \). As Marx points out, in extended reproduction \( v_1 + s_1 \) becomes greater than \( c_2 \).
Let us turn now to Marx's first illustration, presented on pp. 514-517 [586-589]. Marx begins this example with the following first-year value relations:

**Department I:**
\[
C'_{11} = c_{11} + v_{11} + s_{11} \\
6000 = 4000 + 1000 + 1000
\]

**Department II:**
\[
C'_{21} = c_{21} + v_{21} + s_{21} \\
3000 = 1500 + 750 + 750
\]

Note that, as before, the first subscript represents the department (1 or 2), while the second subscript denotes the year (i.e., year 1). Since \(c_{21}\) is less than \(v_{11} + s_{11}\) (1500 < 1000 + 1000), the possibility for extended reproduction exists. The rates of surplus-value are identical in the two departments: both are 100 per cent. The rates of profit differ, however:

\[
r_1 = \frac{1000}{4000 + 1000} = \frac{1}{5}
\]
\[
r_2 = \frac{750}{1500 + 750} = \frac{1}{3}.
\]

We shall return to this point below. The compositions of capital also differ, which is necessarily the case if the rates of surplus-value are the same but the rates of profit are different:

\[
k_1 = \frac{4000}{4000 + 1000} = \frac{4}{5}
\]
\[
k_2 = \frac{1500}{1500 + 750} = \frac{2}{3}.
\]

Marx further specifies that capitalists in Department I capitalize half of surplus-value, i.e., \(p_1 = 1/2\). According to the relations explained above, we may calculate the constant and variable capital employed in Department I during the second year:

\[
c_{12} = c_{11} + k_1 p_1 s_{11} = 4000 + \left(\frac{4}{5}\right)\left(\frac{1}{2}\right)1000 = 4400
\]
\[
v_{12} = v_{11} + (1 - k_1)p_1 s_{11} = 1000 + \left(\frac{1}{5}\right)\left(\frac{1}{2}\right)1000 = 1100
\]

Marx next (implicitly) determines \(p_2\) from the equilibrium condition:

\[
v_{11} + s_{11} = c_{21} + k_2 p_2 s_{21}
\]
\[
1000 + 1000 = 1500 + 400 + (2/3)p_2(750).
\]

Solving, we get \(p_2 = 1/5\). Now we may calculate the constant and variable capital of Department II for the second year:

\[
c_{22} = c_{21} + k_2 p_2 s_{21} = 1500 + \left(\frac{2}{3}\right)\left(\frac{1}{5}\right)750 = 1600
\]
\[ v_{22} = v_{21} + (1 - k_2)p_2s_{21} = 750 + (1/3)(1/5)750 = 800 \]

The second year production value relations are, therefore:

\[
\begin{align*}
C'_{12} &= c_{12} + v_{12} + s_{12} \\
6600 &= 4400 + 1100 + 1100 \\
C'_{22} &= c_{22} + v_{22} + s_{22} \\
3200 &= 1600 + 800 + 800
\end{align*}
\]

Note that Department I has grown by 10 per cent \[((6600 - 6000)/6000 = 0.1)\], while Department II has expanded by 6.7 per cent \[((3200 - 3000)/3000 = 0.067)\]. Marx states that accumulation takes place more rapidly in Department II, but this is clearly incorrect: (1) being larger, Department I accumulates more capital; (2) the rate of accumulation is also larger in Department I, although this is an artifact of the numerical example, and, as we shall see, happens only in the first year; (3) the rate of capitalization of Department I is greater than that of Department II.

Constant and variable capital for year three in both departments may be calculated by the same method as used above. For Department I, we have:

\[
\begin{align*}
c_{13} &= c_{12} + k_1p_1s_{12} = 4400 + (4/5)(1/2)1100 = 4840 \\
v_{13} &= v_{12} + (1 - k_1)p_1s_{12} = 1100 + (1/5)(1/2)1100 = 1210.
\end{align*}
\]

From the equilibrium condition:

\[
\begin{align*}
v_{12} + s_{12} &= c_{22} + k_1p_1s_{12} + k_2p_2s_{22} \\
1100 + 1100 &= 1600 + 440 + (213)p_2(800) \\
p_2 &= 3/10.
\end{align*}
\]

And for Department II:

\[
\begin{align*}
c_{23} &= c_{22} + k_2p_2s_{22} = 1600 + (2/3)(3/10)800 = 1760 \\
v_{23} &= v_{22} + (1 - k_2)p_2s_{22} = 800 + (1/3)(3/10)800 = 880.
\end{align*}
\]

Thus, the value production relations for the third year are:

\[
\begin{align*}
C'_{13} &= c_{13} + v_{13} + s_{13} \\
7260 &= 4840 + 1210 + 1210 \\
C'_{23} &= c_{23} + v_{23} + s_{23} \\
3520 &= 1760 + 880 + 880
\end{align*}
\]

Note that both departments have grown by 10 per cent from the second to the third year. In fact, the system has stabilized from the second year onward: each department grows annually by 10 per cent; and the value of \(p_2\) remains at 3/10. Years one through four of Marx's first illustration are summarized in Table 8.
Table 8. Marx's First Example of Extended Reproduction

<table>
<thead>
<tr>
<th></th>
<th>Department I</th>
<th></th>
<th>Department II</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
<td>$C_{1t}'$ = $c_{1t}$ + $v_{1t}$ + $s_{1t}$</td>
<td>t</td>
<td>$C_{2t}'$ + $c_{2t}$ + $v_{2t}$ + $s_{2t}$</td>
<td>p$_1$</td>
<td>p$_2$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>6000</td>
<td>2</td>
<td>4000</td>
<td>1000</td>
<td>1000</td>
<td>3000</td>
<td>1500</td>
<td>750</td>
</tr>
<tr>
<td>2</td>
<td>6600</td>
<td>1100</td>
<td>1100</td>
<td>3200</td>
<td>1600</td>
<td>800</td>
<td>800</td>
<td>0.3</td>
</tr>
<tr>
<td>3</td>
<td>7260</td>
<td>1210</td>
<td>1210</td>
<td>3520</td>
<td>1760</td>
<td>880</td>
<td>880</td>
<td>0.3</td>
</tr>
<tr>
<td>4</td>
<td>7986</td>
<td>1331</td>
<td>1331</td>
<td>3872</td>
<td>1936</td>
<td>968</td>
<td>968</td>
<td></td>
</tr>
</tbody>
</table>

The stabilized rates of growth for the two departments of Marx's model must be the same -- otherwise the relations between the departments would be disrupted. From this consideration, we may derive the relationship between the stabilized rates of capitalization of surplus-value in the two departments. Let $g_1$ be the stabilized annual growth rate of Department I and $g_2$ that of Department II. By definition of an annual growth rate, we have for Department I:

$$g_1 = \frac{(\text{capital in year } t+1) - (\text{capital in year } t)}{\text{capital in year } t}$$

$$= \frac{(c_{1t+1} + v_{1t+1}) - (c_{1t} + v_{1t})}{c_{1t} + v_{1t}}$$

$$= \frac{c_{1t+1} + v_{1t+1} + p_1s_{1t}}{c_{1t} + v_{1t}} - \frac{c_{1t} + v_{1t}}{c_{1t} + v_{1t}}$$

$$= p_1 \frac{s_{1t}}{c_{1t} + v_{1t}} = p_1 r_1$$

where, recall, $r_1$ is the rate of profit in Department I. By similar reasoning applied to Department II: $g_2 = p_2 r_2$. Since $g_1$ and $g_2$ must be the same, we obtain $p_1 r_1 = p_2 r_2$ or $p_1 / p_2 = r_2 / r_1$. In words, the ratio of rates of capitalization is the inverse of the ratio of rates of profit. For Marx's first illustration, $p_1 = 1/2$, $r_1 = 1/5$, and $r_2 = 1/3$. Thus, the stabilized rate of capitalization for Department II is $p_2 = 3/10$, the result that we obtained previously but more tediously by examining the year to year progress of accumulation. These relations follow from Marx's model, but they are not of intrinsic interest.

Further exploration of the model would take us too far afield from Marx's exposition. Moreover, there are considerations introduced in the third volume of Capital that might be incorporated in the formal treatment of reproduction. The analysis of Marx's second illustration of extended reproduction follows the same principles as the first, and is left as an exercise for the reader.
Glossary

The following glossary compiles brief definitions of the central terms employed by Marx in Volume II of *Capital*.

**aggregate social capital**: the sum of individual capitals and the interrelations among them.

**annual rate of surplus-value**: the ratio of *surplus-value* produced in a year to *variable capital* advanced for that year; the product of the (real) *rate of surplus-value* and the annual number of turnovers.

**capital advanced**: the amount of money that a capitalist must layout for *labor-power* and *means of production* prior to selling the *commodity* product and thereby recovering *money capital*.

**capital employed**: the amount of *productive capital* actually used in the process of production during a particular period of time.

**circuit of capital**: the process by which *industrial capital*-value successively takes on the forms of *money capital*, *productive capital*, and *commodity capital*, moving from the sphere of circulation to the sphere of production and returning to the sphere of circulation.

**circulating capital**: *productive capital* whose whole value is incorporated in and circulates with individual commodity products; capital invested in raw materials, auxiliary materials, and *labor-power*.

**circulation time**: that portion of the circuit of *industrial capital* during which it resides in the sphere of circulation as *money capital* and as *commodity capital*.

**commodity**: a product of human labor that is produced, in order to be exchanged.

**commodity capital**: *industrial capital* in the form of produced commodities awaiting sale.

**composition of capital**: the division of capital into the part that purchases material *means of production* (constant capital) and the part that purchases *labor-power* (variable capital); in terms of use-values: the technical composition of capital; in value terms: the *value composition of capital*; the term *organic composition of capital* expresses the dependence of the *value composition* on the technical composition - 'the value composition, in so far as it is determined by its technical composition'.
**constant capital**: the part of capital that purchases material **means of production** (raw materials, auxiliary materials, and **instruments of labor**); the part of advanced capital that does not expand its value in production.

**Department I**: the sector of the economy that produces commodities that are purchased by capitalists to be used as **means of production**.

**Department II**: the sector of the economy that produces articles of individual consumption purchased by workers and capitalists; subsistence goods are produced in Department IIa, luxury goods in Department IIb.

**exchange value**: the relative proportions in which commodities exchange for each other on the market; an expression of their value; the form in which value is manifested.

**extended reproduction** (capital accumulation): the reinvestment (or capitalization) of a portion of **surplus-value** in new elements of **constant** and **variable capital**, thereby increasing the scale of production.

**fixed capital**: **productive capital** whose value does not circulate completely with an individual commodity product, but that rather spreads its value over many products; capital invested in **instruments of labor**.

**hoard**: money withdrawn from circulation.

**industrial capital**: capital-value that participates in the capitalist process of production and therefore produces **surplus-value**; **money capital**, **productive capital**, and **commodity capital** are the forms of **industrial capital** that are successively assumed as **industrial capital** performs its circuit.

**instruments of labor**: industrial buildings, machinery, etc.

**labor-power**: literally, the capacity for work; the commodity that the laborer sells to the capitalist in exchange for wages; the use-value of **labor-power** is labor; its value is the value of the commodities comprising the worker's subsistence.

**labor process**: the process of creating **use-values**; its factors include the activity of the worker, the industrial buildings, machinery, etc., and the subject of labor (i.e., the object upon which labor is performed).

**latent money capital**: a hoard that will eventually be used to purchase new elements of **productive capital**; also called **potential money capital**.

**means of production**: the material factors of the **labor process**, including raw materials, auxiliary materials, and **instruments of labor** (broadly construed to include, e.g., buildings).
money capital: industrial capital in the form of money, realized upon sale of commodity capital, and used to purchase new elements of productive capital.

necessary labor: that part of the working day during which the laborer produces value equal to the value of labor-power, value that the laborer realizes in the wage.

production time: that portion of the circuit of industrial capital during which it resides in the sphere of production as productive capital.

productive capital: industrial capital in the sphere of production in the form of material means of production and labor-power.

productive labor: labor that produces surplus-value for a capitalist; a productive worker must (1) sell his or her labor-power to a capitalist, (2) participate in the production of a use-value, and (3) be exploited.

rate of profit: the ratio of surplus-value to the sum of constant and variable capital.

rate of surplus-value: the ratio of surplus-value produced (in a period of time) to variable capital employed in production (during the same period); sometimes called the 'real rate of surplus-value' in contradistinction to the 'annual rate of surplus-value'; the rate of surplus-value expresses the degree of exploitation of labor by capital.

realization: the conversion into money form, through the sale of a commodity-product, of the value incorporated in the commodity.

reserve fund: a hoard formed by the capitalist for emergency purposes, to be used to insure the continuity of production when the normal course of the circuit of capital is interrupted.

revenue: that portion of surplus-value spent by capitalists for personal consumption; sometimes used as well to denote workers’ wages, which are also spent for personal consumption.

surplus labor: that part of the working day extending beyond necessary labor; the time during which the worker produces surplus-value for the capitalist.

surplus-value: value accruing to the capitalist as a consequence of the working day extending beyond necessary labor time.

technical composition of capital: the relation between the mass of the means of production employed, and the mass of labour necessary for their employment.
**turnover time:** the duration of the circuit of industrial capital.

**use-value:** the use(s) to which a commodity may be put; its utility based on its concrete properties as an object; sometimes used to refer to the object itself ("a use value").

**value:** the amount of socially necessary labor time for the production of a commodity incorporated in that commodity.

**value composition of capital:** 'the proportion in which it [i.e. capital] is divided into constant capital or value of the means of production, and variable capital or value of labour power, the sum total of wages'

**value-product:** newly-created commodity value, i.e., the sum of variable capital and surplus-value; to be distinguished from the value of the product, which contains in addition a constant-capital component.

**variable capital:** that portion of capital expended (in wages) for the purchase of labor-power; the part of advanced capital that expands its value, in production.

**virtually additional productive capital:** commodities produced in Department I that, when sold, will be employed as new elements of constant capital to expand the scale of production.

**wage:** the value of labor-power in money, expressed on the surface of society as the price of labor; in real terms, the sum of commodities comprising the laborer's subsistence.

**working period:** that part of production time during which productive capital participates in the labor process, where value is created.

**Questions**

1.1 What makes a general act of circulation of commodities simultaneously part of the circuit of an individual capital? Are there general acts of circulation that are not part of the circuit of capital?

1.2 There is a qualitative division of money capital into one part purchasing means of production and another part purchasing labor-power. Why does Marx say that this division also expresses a quantitative relation? Can this division be related to the concept of the composition of capital, introduced in Volume I?
1.3 How is it that the class relation between workers and capitalists is presupposed by the exchange of money capital for labor-power (M → L)? What is the relationship between the circuit of capital and the circulation of labor-power as a commodity?

1.4 How can money capital be capital if it can only perform the functions of money? What distinguishes money capital from money generally?

1.5 Why does Marx say that capitalist production has a disintegrating effect on all older modes of production? In your answer you may wish to refer to material in Volume I of Capital.

1.6 What are the different roles played by means of production and labor-power in the creation of value? In the creation of surplus-value? Make reference to Volume I if necessary.

1.7 Explain how Marx employs the symbols C, c, M', M, and m. Why does he use the symbol M to represent advanced capital even when some of this advanced capital is capitalized surplus-value?

1.8 What does Marx mean when he says that M' and C' do not differ as money capital and commodity capital but as money and commodities? What is the relationship that P bears to both M' and C'?

1.9 How does Marx use the term "industrial capital"? What is the relationship between this concept and the three forms of capital discussed in this chapter: money capital, productive capital, and commodity capital?

1.10 Marx presents two examples of capitalist production that have abbreviated circuits: the production of the money commodity (gold), and transportation. Explain the two examples. What points does Marx develop from these examples?

1.11 What are the distinguishing features of the circuit of money capital?

1.12 In what sense is the circuit of capital the unity of circulation and production? Why must both be included?

1.13 What is illusory about the circuit of money capital?

2.1 In discussing simple reproduction why does Marx say that m is not advanced but spent? What is the relationship between the worker's (L → M → C) and the capitalist's (c → m → c) consumption, on the one hand, and the circuit of capital on the other?

2.2 How can the process of reproduction at times continue even when produced commodities do not really enter individual or productive consumption? How is this important to an understanding of economic crises?
2.3 In discussing the relationship of the circuit of money capital (M . . . M') to that of productive capital (P . . . P), Marx states that the second form of the circuit is a "criticism" of the first. He explains that the circuit of productive capital reveals the dependence of money capital on the process of reproduction. Why is this an important point?

2.4 What is a hoard? What is latent money capital? How are the two concepts related? How does latent money, capital figure in the circulation of capital?

2.5 What is the difference between simple reproduction and reproduction on an extended scale? How is this difference reflected in the circuit of productive capital?

2.6 Why does Marx say that it is incorrect to derive the properties of productive capital from its mode of existence in means of production?

2.7 What is a reserve fund, and what is its relation to latent money capital?

2.8 The circuit of productive capital encompasses the same acts of exchange and production that comprise the circuit of money capital. What, then, is Marx's purpose in introducing this second form of the circuit of industrial capital?

3.1 Marx argues that the circuit of commodity capital implies the existence of other industrial capital in the form of labor-power and means of production purchased as commodities. Why is this significant? Why is it that the other two forms of the circuit do not have similar implications?

3.2 Why is the third form of the circuit particularly suited to the analysis of the total social capital, while the other forms of the circuit are better adapted to the analysis of individual capitals?

4.1 In what sense is the circuit of industrial capital the unity of production and circulation? The unity of the three forms of capital and their circuits?

4.2 Why is it important to consider capital as self-expanding value, not only in terms of class relations, but also as a circuit-describing process going through various stages?

4.3 Why does Marx distinguish between value and exchange value in his discussion of the expansion of capital-value? Why does value function as capital only in so far as it remains identical with itself and is compared with itself?

4.4 Why is it that an exchange within the circuit of an individual capital does not necessarily represent the intertwining of the metamorphoses of different capitals, even though an exchange C--M on the part of the seller implies M--C on the part of the buyer?
5.1 What is the time of production? What are its different parts? How does each of these parts figure into the production of new value? Of surplus-value? Of the transfer of value from the means of production to the product?

5.2 What is the time of circulation? What are its parts? What is the role of circulation time in the creation of value and surplus-value?

6.1 Do wage laborers engaged in buying and selling produce value or surplus-value? Do these laborers perform surplus labor? How are they paid?

6.2 Is bookkeeping productive labor? How does bookkeeping differ from buying and selling?

6.3 How is it possible for labor that is unproductive from the point of view of society to be productive for the individual capitalist?

6.4 Marx argues that supply formation is common to all modes of social production. What are the general characteristics of supply formation? What are the specific characteristics of supply formation under capitalism?

6.5 How, and to what extent, is the labor expended in maintaining supplies productive of value? To what extent, and under what circumstances, are the costs of supply formation unproductive?

6.6 What does Marx mean when he writes (p. 152[225-226]), "The general law is that all costs of circulation which arise only from changes in the forms of commodities do not add to their value"? In this context, what is meant by "changes in the forms of commodities"?

6.7 Is labor expended in transportation productive or unproductive? How does transportation affect the value of goods transported? Why does Marx consider transportation to be a branch of industrial capital?

7.1 What is the turnover of capital? What is the time of turnover?

7.2 Why does Marx employ the circuits of money capital and productive capital, in preference to the circuit of commodity capital, in his examination of turnover?

8.1 What is the difference between fixed and circulating capital? What is the basis for the distinction between them?

8.2 How does the distinction between fixed and circulating capital differ from that between constant and variable capital?
8.3 Why is the distinction between fixed and circulating capital applicable only to productive capital and its circuit? Why does Marx say that money capital and commodity capital are "circulation capital" but not circulating capital?

8.4 What are the different causes of wear and tear? How does wear and tear of fixed capital transmit value to the product?

8.5 How, and to what extent, do costs of maintenance and repair enter into the value of the product? Is capital employed for maintenance and repair fixed or circulating capital?

9.1 Why does Marx employ the circuit of money capital to derive the aggregate turnover of advanced capital?

9.2 Explain how the specific turnovers of the components of advanced capital are combined to obtain the aggregate turnover.

9.3 How is the turnover of fixed capital related to the business cycle?

10.1 How does the distinction between fixed and circulating capital appear in the work of the physiocrats? Why does Marx argue that they draw the distinction in an essentially correct manner?

10.2 What are the primary ways in which Adam Smith confuses the distinction between fixed and circulating capital? What are the negative consequences of Smith's confusion?

11.1 How is Smith's confusion regarding the distinction between fixed and circulating capital reflected in Ricardo's work?

11.2 What negative implications does an incorrect analysis of fixed and circulating capital have for the work of later economists?

12.1 What is the working period? How do differences in the working period affect the turnover of fixed capital? Of circulating capital?

12.2 Why is the capitalist motivated to decrease the working period? How may this purpose be accomplished?

13.1 How can the time of production exceed the working period?

14.1 Of what does the time of circulation consist? What factors affect the time of circulation?

14.2 How can the process of circulation affect production time?
15.1 Why is additional money capital for circulating capital required to insure the continuity of production during the period of circulation? How is the amount of this additional money capital determined?

15.2 Why is it the case that, during the period of turnover, a portion of industrial capital always exists in the form of money?

15.3 How is the supply of money capital affected by a change in the period of circulation? By a change in the price of materials of production (raw and auxiliary materials)? By a change in the price of the product?

16.1 What is the difference between variable capital advanced by the capitalist and variable capital employed in production?

16.2 Distinguish between the annual rate of surplus-value and the real rate of surplus-value. Explain the relations expressed in the formulas: \( S' = \frac{s'n}{v} = s'n = \frac{sn}{v} \).

16.3 How does a difference in their periods of turnover cause the annual rates of surplus-value of two capitals to differ, even if their real rates of surplus-value are identical? Illustrate this point.

16.4 What are the consequences of a long period of turnover from the point of view of an individual capital? From the point of view of society?

17.1 How does the accumulation of latent money capital figure in the development of the credit system?

17.2 Assuming the use of metallic money, where does the money required for the circulation of the commodities of a country come from? Where does the money required for the circulation of surplus-value come from?

17.3 Individual capitalists, and the capitalist class as a whole, obtain more money from circulation when they sell their products than they advanced for production. Who places the additional money in circulation?

17.4 How can there be a general increase in wages under simple reproduction? What is wrong with the argument that an increase in wages necessarily leads to increased demand and higher prices for subsistence goods, or to general price increases?

17.5 What is the difference between the circuit of money and the currency of money?

17.6 Where does money required for extended reproduction come from? What is the role of the credit system in decreasing the costs of circulation?
18.1 What are the components of the general circulation of commodities? Why does the circuit of individual capitals considered in the aggregate comprise not only the circulation of capital but also the general circulation of commodities?

18.2 What are the two aspects of money capital revealed by the study of the turnover of an individual capital?

18.3 Why does Marx say that the amount of functioning money capital does not place absolute limits on the scale of capitalist production?

19.1 What are the contributions of the physiocrats to an understanding of the process of reproduction? Why does the limited horizon of the physiocrats enable them to formulate an essentially correct conception of reproduction?

19.2 Explain Adam Smith's argument that all commodity-value "resolves" itself into variable capital and surplus-value. What happens to constant capital? What are the difficulties with Smith's thesis? Is there a sense in which Smith is correct?

19.3 Why does Marx say that Smith confuses the value of the annual product with the newly produced annual value?

19.4 What are the positive contributions of Smith's analysis of reproduction?

20.1 What are the components of the annual social product? Why does the annual product include both productive and individual consumption?

20.2 Why does Marx choose to employ the circuit of commodity capital (C' . . . C') for the analysis of the reproduction of the aggregate social capital?

20.3 In studying the process of reproduction at the level of the aggregate social capital, why is it necessary to examine not only the replacement of the value of the parts of the annual product, but as well the replacement of their substance (i.e., their use-value)?

20.4 How does Marx define the two departments of social production? What are the components of the value of the total annual commodity product of each department?

20.5 Under the assumption of simple reproduction, why must the variable capital plus surplus-value in Department I equal the constant capital in Department II (I_v+s = II_c)? Note that I_v+s is newly created value incorporated in means of production, and II_c is the value of pre-existing means of production used in producing articles of consumption. Keeping in mind what simple reproduction means, does this equality of values make sense?
20.6 On what basis, and to what purpose, does Marx divide Department II into two parts? Why does he say that part of the working class depends for its livelihood on the prodigality of the capitalist class?

20.7 Why is it tautological to say that crises are caused by a lack of effective consumption? What is the relationship between the business cycle and the consumption of the working class?

20.8 What role does money play in the process of reproduction? Who advances the money necessary to circulate the annual product?

20.9 Why is it the case that the money advanced for wages by capitalists in Department I returns to them not directly but indirectly?

20.10 What is the nature of the exchanges that take place within Department I? What is the value of the commodities exchanged?

20.11 How is it possible for the entire value-product of the total social working day to be consumed, at the same time that a part of this working day (2/3, in Marx's illustration) is spent in Department I for the production not of consumption goods, but of means of production? Why, in this context, does Marx refer to the exchange between departments \((\text{II}_c = \text{I}_v + \text{s})\) that takes place under simple reproduction as an exchange of part of this year's working day for part of last year's?

20.12 Why does it appear as if new elements of constant capital are produced without any of society's labor being expended in their production? Why is this appearance false?

20.13 Distinguish between the year's value-product and the value of the year's product. What is the significance of this distinction for understanding the process of simple reproduction?

20.14 What is the nature of the exchanges that take place between the working class and the capitalist class? Row is the class relation between workers and capitalists reproduced as part of the process of simple reproduction?

20.15 What does Marx mean when he says that variable capital always stays in the hands of the capitalist? What, then, is the relationship between the variable capital of the capitalist and the revenue (wages) of the worker?

20.16 How can simple reproduction take place if only some elements of fixed capital need to be replaced at the end of a given year, while all fixed capital contributes wear and tear to the value of the product?

20.17 Suppose that different amounts of fixed capital wear out in different years. Why does this circumstance create a disproportion between production of fixed and
circulating capital, and, therefore, conflict with the requirements of simple reproduction?

20.18 In de Tracy's theory of reproduction, what are the sources of profit for industrial capitalists? Explain Marx's criticism of this theory.

21.1 What new considerations are introduced when extended reproduction is investigated not from the perspective of an individual capital, but for the aggregate social capital?

21.2 What is potential money capital? Is it different from latent money capital, discussed in Chapter 2? What is the role of potential money capital in the process of extended reproduction?

21.3 Why is it that the balance of circulation can be maintained only on the assumption that the value of capitalists' one-sided purchases and that of one-sided sales tally? Is such an equivalence inevitable or accidental?

21.4 What is virtually additional productive capital? Where is it produced? What is its relation to potential money capital? What is its role in extended reproduction? Why is not only the value, but also the use-value, of virtually additional productive capital important?

21.5 Why must the amount of money available for circulation be larger under conditions of extended reproduction? What is the role of the credit system in this context?

21.6 If reproduction on an extended scale has nothing to do with the absolute volume of the product, what does it entail?