

CHAPTER III

THE CAUSES OF INTEREST

§ 1

The Factors of Production

The factors of production may be said to be land, labor and capital.¹ Some writers mention business leadership as a fourth factor, but this since it involves mental *effort* and requires directing ability, may properly enough be regarded as a kind of labor. Other writers class land with capital, but we have already found reasons to consider land separately from goods produced by mankind,² and shall have reason further to press the distinction, later on.³

Let us now consider what fixes the amount of each factor of production. As to land, little need be said. Its amount is practically fixed by nature. There is, to be sure, some "made land." The people of Holland have dyked back the North Sea and made cultivable a considerable area which would otherwise be largely under water. There are doubtless other cases where land is "made" by human effort, though not on so large a scale. But it is nevertheless almost absolutely true that

¹ Since capital depends upon productive effort plus saving, the ultimate factors are land, labor and saving (or waiting). Cf. Senior, *Outlines of the Science of Political Economy*, fifth edition, pp. 58-60.

² Chapter II, §§2, 3 and 6.

³ Chapter IV, §§ 3 and 5.

the amount of land space in existence is fixed by nature and cannot, practically, be changed by man. The barrier to increase of available land space is not absolute. It is conceivable, for example, that shallow parts of the ocean might be filled in by dredging sediment from other shallow parts. But the expense would almost invariably be prohibitive, certainly in relation to the expected gain. In other words the (marginal) cost of production of land, if it were necessary to produce much of it in the way suggested, would be tremendously high, and land would have to get tremendously scarce and high in value before it would be worth while so to produce it to any appreciable extent. The value of land space, therefore, as pointed out in the last chapter,⁴ cannot be said to depend in any marked degree, if at all, on the cost of production of land. Nor can the amount of land space in existence be said to depend on the amount for which land will sell or upon the profits which land ownership yields. Thus land space differs from most other goods in the relative fixity of supply, for a higher value of other goods or a higher profit from their use, or a greater efficiency of labor, may affect the supply of such goods considerably. Though land fertility may be increased by labor, land space practically cannot be. So far as the fertility of land is

⁴§6. For further discussion and elaboration of the various points of difference between land and capital, and for critical consideration of views inconsistent with that presented in this book, see Chapter IV, §§3 and 5, and Chapter VI, §§1, 2, 3 and 8.

given by nature and is not, practically speaking, dependent on the efforts of man for its maintenance, we shall class it with land space as a part of the factor *land*. So far as it is a *produced* fertility, we shall regard it as *capital*.

§ 2

The Accumulation of Capital

Land may be regarded, in a sense, as one of the tools man has to work with, a tool furnished by nature. Man's other tools, though drawn from the land, are furnished, in a sense, by himself. He constructs them and fits them to suit his needs. With these tools we should include such improvements on the land as foresting, draining, fertilizing, fencing, clearing, leveling, etc., as well as the buildings placed upon the land. All of these things can be increased by human effort and are not fixed in quantity in the same degree as land.

Among the things produced by men, it is necessary to distinguish those made for personal pleasure or practically immediate consumption and those made as steps towards future consumption, such as accumulated stocks of goods, buildings, tools and machinery, etc. The former we call consumptive goods, and the latter we call capital. While it may be hard to determine, in some borderline cases, to which class certain things belong, the general distinction is sufficiently clear for use in our further discussions.

What determines the extent to which such capital will be accumulated? Several influences are important. First, may be mentioned the

efficiency of production. In a community where wealth is easily produced, a large amount can be accumulated with less deprivation of immediate wants than if productive effort were less efficient. Rich natural resources, well-trained and intelligent labor, high capacity for work, all tend to facilitate accumulation. And the fact that accumulation has taken place in the past and that, as a consequence, the community has more and better machinery of production, certainly tends to make productive effort more effective and so to make further accumulation easier.

In the second place, the amount of capital depends upon personal characteristics of the members of a community, upon the extent to which they desire to save and are willing or anxious to deny themselves present gratifications for the sake of the future of themselves or their children, or other dependents.⁵

§ 3

The Productivity of Capital

We are now ready to begin our discussion of the distribution to different economic classes, of what the industrial and commercial processes produce for human use and consumption. First among the shares received, we may consider the interest on accumulated capital. This has been said by some writers to be due to the productiveness or

⁵ Perhaps the best statement of the influences that lead to and that retard accumulation is to be found in Fisher, *The Rate of Interest*, New York (Macmillan), 1907, Chapter VI. John Rae, Böhm-Bawerk and others have also developed this subject.

productivity of capital, and by others to be a consequence of the fact that to get an accumulation of capital there must be a degree of abstinence practiced or that an inducement must be offered to get men to sacrifice present consumption for future. Let us examine these alleged causes of interest with a view to determining what their significance may be for our problem.

That capital is productive in the sense that we can get more with it than without it, is generally recognized. It is recognized simply because experience indicates that it is a fact and not by virtue of *a priori* reasonings. And experience indicates it to be a fact, not in the sense that every possible mode of production with capital is more effective than production without it, but only in the sense that, given any stage of knowledge of how to use capital, production is more efficient if we can get a certain amount of capital to use *in the understood ways* than if we can not. No one would seriously contend that every use of machinery or other capital was advantageous. It is entirely probable that we often use valuable (in the sense of having high cost) and complicated machinery to do work that could be as effectively done without it or to do work not worth doing. We construct buildings of stone in places which are soon deserted and where, therefore, frame buildings—though less enduring—would be more economical. And where we do use capital advantageously, it often is true that an attempt to use it on a much greater scale would not be worth while. To lengthen the production process by introducing more steps is not desirable

without limit. The thought will perhaps occur to the reader, not only that capitalistic or "round-about"⁶ production processes either may or may not be advantageous, but also that if those which we use are, for the most part, advantageous, this is because we would not intentionally use them if they were not. On the hypothesis that present pleasures are always preferred to future ones and future discomforts to present ones, this view is justified. But it might easily be the case that a person or group of persons would rather do work today which should find its fruition years hence when needs are great and strength is small than to do the work now for a like present reward, or later for a later reward.⁷ We cannot definitely assert, therefore, that a long time process of production, involving the making of machinery or the planting of trees or some other early labor as an intermediate step to getting a future product, would never be chosen in preference to a short time process, unless there were an advantage in choosing it from the point of view of a larger total product. Often we might find advantage enough from saving, in having nature offer us the opportunity to store up labor—which it happens to be convenient for us to undergo today—until a future when its product is more needed.⁸ Never-

⁶ Böhm-Bawerk's expression. See *The Positive Theory of Capital*, English Translation, London (Macmillan), 1891, or *Positive Theorie des Kapitals*, Dritte Auflage, (Innsbruck), 1912.

⁷ Cf. Carver, *The Distribution of Wealth*, New York (Macmillan), 1904, pp. 232, 233.

⁸ But unless there were a gain from thus investing, the average person would probably simply hoard some indestructible form of

theless, although some kinds of capitalistic production may not profit us, and although we might be willing to produce capitalistically to some extent without getting a consequent larger return; yet that we usually do, in practice, secure a much larger product with the use of capital than we could secure without it, is a conclusion resting on hardly-to-be-denied experience. And so long as we can find ways of thus producing capitalistically which are gainful, i. e. which yield us more than the same effort would yield if a part of the effort applied were not first devoted to capital formation, we are not likely to waste our time in the many (perhaps) possible ways of capitalistic production which do not yield a gain.⁹

In connection with our argument that capital makes production more effective, the qualification should be made that this principle applies as logically to the production of noxious drugs, burglar's tools and other socially undesirable articles or services, as to the production of socially desirable goods. Capital becomes altogether beneficent only if all possible anti-social uses of it are prohibited. Again, roundabout or capitalistic production must be held to include activities other than the construction of what is ordinarily called material equipment. It includes activities which work out their long runs effects through

wealth such as gold. Possibly an iron-clad government guarantee of the return of each person's capital in any form on demand would be equally as satisfactory as hoarding, to some.

⁹ This is not to deny that we will use capital to keep (store) the products of one season for use in another, though the capital so used increases only utilities and not material goods.

changes wrought in men's minds. Thus, it may be regarded as including education pursued for the purpose of increasing one's earning power. It includes also such activities as the bribery of public officials and the attempt, by misleading public sentiment and by building up political machines, to get thereby, for those pursuing such policies, profitable contracts and other advantages in the future, at public expense. A business concern which, by thus taking measures and making expenditures to secure for itself the opportunity of getting profitable if dishonorable business, has, so far as its purposes are concerned, increased its capital as much as if it had increased its investment in buildings or machinery and is, from its point of view, engaged in roundabout or capitalistic production.

It is to be emphasized that capitalistic production is time-using production. Instead of plucking, as we need it, the wild grain, and so keeping an interval of but minutes or even seconds between effort and the satisfaction of needs, we sow or plant the grain months before we expect to reap it; we build barns which—though we may soon *begin* to use them—we shall not have *finished* using, perhaps, at the end of half a century; we manufacture plows, harrows and reapers which will not yield us, for many years, all that it is in them eventually to yield; we construct factories for the manufacture of these implements, factories which, when their builders have long since ceased to build, will still be turning out implements of agriculture for long continued future use; we build bridges, lay tracks, erect stations and con-

struct locomotives, any or all of which can not, ordinarily, yield us this year or next an advantage at all comparable to their cost—i. e. to the advantage which our effort might have brought if devoted to the satisfaction of more immediate needs—but which, in the long run, pay for themselves often several times over. In all of these cases we interpolate a long period of time between the putting forth of effort and the receiving of its entire product, though in some of the cases a small part of the resulting product is enjoyed early.

Production may be made more capitalistic by increasing the *length of time of waiting* between effort and enjoyment of the results of effort, or by increasing the proportionate *amount of effort* (more accurately, perhaps, by increasing the proportionate amount of labor, of land, and of available tools) which is directed to remote instead of comparatively immediate ends. In either case there would be an increase in the average time, all work considered, between the putting forth of effort and the receiving of its fruits. Thus, the time elapsing between effort and the receiving of the entire reward of the effort is increased when, instead of making frame buildings for factories, we construct the factories of structural steel. The buildings are more permanent; a longer time elapses before they have rendered all the service of which they are capable. But we also increase the roundaboutness of production if, without lengthening the production period for any one factory, we divert a part of our labor force, previously occupied in utilizing existing equipment,

into the work of building an additional factory. It may easily be that all of the labor employed in (say) shoe production *could* be employed in keeping up and in operating the existing factories and machinery; and that nevertheless production would be larger if some of this labor was used for the building of another factory, since thus there would be more space and larger equipment per operator. Such diverting of a part of shoe-producing effort to the *addition* of shoe-producing equipment would be, no less than to make equipment more durable, an increase in the roundaboutness of production.

So, also, the diverting of coal mines which had been used for the production of coal to run the machinery of an existing shoe factory, into the production of coal for the smelting of iron and for the making of structural steel to be used in building an *additional* shoe factory, would mean a use of the coal mines, as well as of the labor of the operators, in a more roundabout way than before. Again, the diverting of land from use as pastures and for the production of hides to be used in shoe making, into forest growing and the production of lumber for the building of shoe factories would be, in respect to such land, an extension of the roundaboutness of production. Such a change to greater roundaboutness in the production on exceptionally well located (or otherwise good) land would be likely to mean a larger change in the degree of roundaboutness of production¹⁰

¹⁰It is, of course, assumed at this point, that the land in question is reasonably well adapted to either use.

than a corresponding shift in the kind of production to which inferior land is put. Still again, the productive use of both land (the site) and capital (the building) is made more roundabout if a factory intended for the manufacturing of shoes is used for the making of shoe manufacturing machinery. Any parts of the product which may be attributable to the land or to the capital as well as what is attributable directly to labor, then take more largely the form of capital or instruments of further production than before and less largely the form of consumption goods.

There seems, however, little point to speaking of *capital* (i. e. produced equipment goods) as being diverted to greater or less roundaboutness in production since capital is itself but a stage in the roundabout application of labor applied to natural resources. Capital is an intermediate good and a derivative of more ultimate factors. To divert capital to more roundabout production is really to bring it about that the original labor of constructing this capital was more largely roundabout than it otherwise would have been and that the land space utilized in the process of its production was also devoted to the securing of more remote ends. Let us conclude, then, that the roundaboutness of production is increased when labor is diverted from less to more roundabout processes and that this change is greater when the labor is working on sites which yield a surplus or rent above wages,¹¹ since this surplus then, as well as the

¹¹ Providing, of course, that a surplus is produced when the land is devoted to the more roundabout process.

(marginal) product of labor, takes the form of production goods.

The roundaboutness of production has been increased, to use another illustration, by the building of railroads. Let us suppose two towns, A and B, 200 miles apart. In the absence of better means of transport, goods are carried from the one town to the other and different goods returned in trade, by men acting as carriers. It takes, let us say, a week, for twenty men to carry a ton of goods from A to B. Omitting, for the present, considerations regarding the raising or manufacture of these goods, we may say that only a week of labor precedes the consumption of the goods and only two weeks precedes a complete trade and the consequent consumption aimed at by the people in both towns. And all of the benefits towards which the two weeks of labor were directed follow with relative quickness the putting forth of the effort. If, however, instead of carrying the goods on their backs, the carriers make carts or wagons and domesticate animals to draw these, their accomplishments may be much greater; but the period during which these accomplishments are realized will be, in relation to the period of effort, more deferred than before. A wagon may, indeed, be made in a week's time and by the end of another week it may have carried more goods between the two towns than the maker could carry, without it, in a month or more. But the wagon will not, in a week, be worn out. On the contrary, it will presumably be in condition for use during many later weeks through all of which the service rendered by it is largely a result of the labor put forth in

making it. The rewards of that labor (of making the wagon) are, therefore, *on the average*, more deferred than the rewards of the labor of carrying when wagons were not used. Suppose, next, that a railway is built between the towns. The building requires three years, during most of which period the rails can not be used to carry goods. At the end of the three years, the possible trade may be, indeed, much greater than before and the carriage of goods swifter; but the labor of building the railroad will still be contributing to community welfare long after those who built the road have ceased to be able to lift a spade or carry a tie. Surely the length of time elapsing between effort and the *totality* of the reward of that effort, or even the earlier half of the reward of that effort, has been tremendously increased. By no means all improvements in the processes of production are of the time-lengthening character. But it does appear to be true that many of them are so. Our orchards, our irrigated farms, our stone-paved streets and concrete sidewalks, our buildings of structural steel, our complicated machines of steel and iron, our railroads, and our great steel ocean-going vessels,—all involved for their construction labor the fruits of which are not enjoyed in full until long years beyond the time when the labor was put forth.

§ 4

Capital Accumulation versus Marginal Capital Productiveness

But although the more roundabout processes of production seem to be—at least, those that we actually do follow—clearly advantageous to us, yet our gain seems to be proportionately smaller as we thus utilize proportionately larger amounts of labor. To add to the community's equipment a certain number of railroads, buildings, machines, fruit orchards, etc., may add immensely to the product we can hope to realize from our efforts, while a further amount of labor devoted to the still greater increase of such equipment would be of diminishing advantage, and a still further devoting of time to such a purpose of yet smaller benefit. A single railroad between New York and Chicago is tremendously advantageous as compared with none at all. A second railroad may be of great importance but is less nearly indispensable. A third and a fourth may be desirable enough to be worth building. But there comes a point of relative sufficiency of such railroads, beyond which it pays better to devote our labor to other purposes.

Again, while it may be far better to have one or more railroads between two points than not to have them, there will be, perhaps, a less proportionate gain from the added expenditure necessary to make the lines relatively straight. It is much better to have a winding road than no road at all. A straight and level road might involve tunneling through mountains and the bridging of gulleys

and might be, therefore, immensely more expensive in initial cost; while yet it might, eventually, be labor saving. In other words, a given large amount of effort is likely eventually to accomplish more if the straight road is built. But the per cent gain may diminish with each such improvement.

The addition of stock, buildings and machinery to a farm reaches, in time, a point beyond which it is not worth while to go. A barn may seem almost indispensable. That more time should be devoted to its building, making it larger, or that two barns should be built, may be desirable for the sake of having a protected space for the bumper crops of exceptional years; but a second barn is of much less importance than a first and may be said to bring a diminishing advantage. Even the fact that part of such a crop must be stacked may not be a sufficient reason for the building of the larger or the second barn, in view of alternative opportunities for the employment of the necessary labor. Likewise, a mowing machine, though requiring more initial labor to make and, therefore, a much higher price to buy, is immensely to be preferred to several scythes. A second mowing machine is of less advantage though the gain from having it also may be considerable. Sometimes the possession of the second machine may make possible the getting in of a crop during a short sunny period, or the use of a team which cannot, for a few days, be otherwise used to advantage; or the second machine may temporarily be the sole resource if the first happens to be, for any reason, out of commission. The gain from a third

machine would be negligible and from a fourth there would perhaps be no gain at all. Again, to take another illustration from agriculture, the grain product which a given amount of labor can secure, will be greater if cradles are used for reaping than if sickles are used, and very much greater if a reaping machine is used. Or we may say that a given grain product can be realized from a given land area with a smaller expenditure of labor when the improved machinery is used than when reaping is done with the tools of an earlier generation. And still further gain, though perhaps less gain proportionally, is realized from the use of modern reapers which bind the grain as well as cut it. Nevertheless, there is undoubtedly a limit, though perhaps an elastic one, as to both quantity and quality of machinery beyond which it is not worth while to pass.

But if, in any community, only a limited amount of effort (as well as of land and equipment already available) can be devoted to the construction of equipment for production, consideration must be given to the fact that some equipment is more important than other. The farmer can get along without a reaper better than without a barn. He can get along without a silo better than without a reaper. The railroad can get along without stations or with inadequate stations better than it can get along without a track, engines and cars. The city can get along without stone paving on its streets better than it can get along without any streets at all.¹²

¹² It is not at all obvious as Cassel appears to suggest that it is (*The Nature and Necessity of Interest*, London—Macmillan—,1903,

We conclude, then, that the gains from roundabout production tend to diminish as such production is extended, and tend to diminish whether the extension of roundaboutness takes the form of the addition of equipment beyond the most necessary kinds, or of an additional amount of equipment of all kinds, or of more expensive quality of equipment. In fact, when the amount of effort, land and tools available for the production or maintenance of desirable capital equipment is greatly limited, the effect is likely to be as apparent in the making of poorer and cheaper equipment as in a diminution in the number of equipment implements.¹³ The reason is that the

pp. 31 and 55) that the diminishing return to capital as capital is increased, is related to the law of diminishing returns from land. It is true enough that as the application of labor to land increases, after the point of diminishing returns is reached, the returns yielded to the further applications of labor become relatively smaller, and this is doubtless equally the fact whether the labor is directly or indirectly (i. e. by first being devoted to capital making) applied. But it does not follow that the *net per cent gain* of roundabout over direct production will be any less because population is large in relation to natural resources and because the returns to both roundabout and direct production are therefore small. To express differently the same thought, if the value of capital is measured by the other goods which the capital-forming labor (and other factors of production) could have produced as an alternative, the per cent return on this value is not necessarily any lower because of a lower margin of production on land. The correct opinion appears to be clearly stated by Jevons, *The Theory of Political Economy*, fourth edition, London (Macmillan), 1911, p. 255; Cf. also p. 314 (Appendix III).

¹³ This view is clearly held by J. B. Clark although he seems not to have thought it necessary to present the argumentative defense of it which follows above. See *The Distribution of Wealth*, New York (Macmillan), 1899, pp. 174-177.

competition of employers for the use of equipment will result in relatively poor equipment for the use of nearly all labor rather than in splendid equipment for some labor and none at all for the rest. A small amount of the poor equipment yields greater advantages to those enterprisers who would otherwise have none—and they can therefore bid higher for it—than a corresponding addition to the *quality* of their equipment would yield to employers who might be especially favored with the more costly buildings, machinery, etc., but who could not, because of the limited amount of this capital, employ all the community's available labor. In other words, although the more costly equipment would presumably be more durable or otherwise superior, yet if the necessary labor of its construction would be so great as to mean an inadequate *number of implements* for the labor force of the community, the bidding for the use of capital of those who might otherwise have none, would prevent putting all available capital value into the more durable or otherwise more expensive form. Let us suppose a community for the use of which an amount of capital is available large enough to house all its industries in frame buildings but sufficient to house only half of them in buildings of structural steel and concrete. Though the more substantial buildings would perhaps have a potential life more than twice as long, yet, *in view of the assumed existing situation*, it would not be desirable to choose them. The extra investment of labor that would have to be made to construct a given building in the more substantial way, could be used to get a second of the less

substantial buildings along with the first; and this would be the more worth while investment, until the community became richer and could spare labor from other activities to construct a relative sufficiency of the more expensive buildings.¹⁴ An additional cheap building would add

¹⁴ J. B. Clark, criticizing Böhm-Bawerk, says (*The Distribution of Wealth*, New York—Macmillan—,1900, p. 138) that adding to the length of the production periods "does not necessarily add to the amount of capital in existence," that, if it does not, "the increase in the average length of the periods does not have the effect that the brilliant Austrian economist attributes to this lengthening, for it does not reduce the rate of interest" which might "be high when the periods were long and low when they were short" and that it is "when the *quantity* of permanent capital increases that interest falls."

Professor Clark's theory, however, is more easily to be reconciled with that of Böhm-Bawerk than he appears to realize. In the first place, a lengthening of production periods distinctly tends towards an increase of the amount of capital. Consider the case of a man who is about to work for 100 consecutive days. If the average period of production is short, he may spend 5 days in making a capital instrument which yields its services during the next 5 days during which the man is producing another to take its place, and so on throughout the 100 days. There will, then, at no time be more than 5 days of labor stored up as capital. But the production period may be much longer. Thus, it may require 50 days to make an instrument which yields its services during the next 50, during which it is replaced. In this case, although no more days than in the other are devoted to capital production, there is always—after the first 50 days—50 days of labor stored up in capital. The *amount* of capital in existence at any one time is much larger. (Elsewhere—pp. 293-295—Clark himself recognizes this principle.) Assuming the amount of saving done in a community to be such as to cause many to engage in such longer production processes and assuming that the increased length of period does not correspondingly increase the product, we should have to conclude that the rate of interest would be lower.

In the second place, it is *just because* an indefinite increase in the length of the production periods will not correspondingly increase

much more to the efficiency of labor in such a community than *greater durability* of a building certain to be constructed in any case. Hence an employer of labor would prefer to use what capital he could get, in the former way. Hence, also, prospective borrowers of capital desiring to use it in the former way could afford to pay more for its use.

It should be emphasized that the use of capital does not necessarily mean a progressively larger product, does not mean, for instance, a larger product next year than this. All it means is a

the returns to labor, that so much labor is devoted as is devoted, to the production of the shorter-lived capital instruments and that the marginal productivity of these shorter-lived instruments is reduced to a comparatively low return. Suppose the average production period to be a year and capital to yield, at the margin, 10 per cent. Increased saving might, by increasing capital, reduce the marginal gain from using it to (say) 8 per cent. But if it should meanwhile appear that these savings could be used in a three-year roundabout process yielding at the rate of 10 per cent a year or 33.1 per cent (compounding) for the three years, the one-year instruments would be less constructed and would become comparatively scarce. Hence their marginal product would become as great as 10 per cent and interest would become 10 per cent. If however, the lengthening of the production period would *not* correspondingly increase the product, this lengthening would be less resorted to and more one-year instruments would be constructed. Hence, interest might fall to 9 or 8 per cent. Even, therefore, if we were to regard increased length of production periods as not involving any increase of capital more than would be involved in devoting the same labor to the production of short-time capital instruments, and even if we were to regard the rate of interest as being fixed directly by the marginal productivity of these short-time instruments, the possibilities of resorting to roundabout production would still have to be taken account of as conditions determining the amount of short-time capital that would be constructed.

larger product next year than next year's product would be if capital were not used. We may choose to produce capitalistically up to and not beyond a certain limit. If we so choose, we may go on, year after year, producing the same amount of wealth and maintaining an unchanging standard of living, but getting, each year, more than we could get with corresponding effort, were our methods of production less capitalistic.

§ 5

Saving or Abstinence in Relation to Interest

In order that the more productive roundabout process may be followed, there must be saving. For the roundabout process means, as we have seen,¹⁵ productive effort the full reward of which is greatly deferred. The labor of building a railroad must be fairly well completed before the resultant services can begin, and not for many years are these efforts rewarded with *all* the services towards which they were directed. Yet the persons who build the railroad must have food and clothing while they are at work. In like manner, the labor of building a factory for the making of agricultural machinery may be an initial step in the securing of wheat and, therefore, in the securing of bread. The persons who perform this labor must have food and presumably, bread, yet the labor does not immediately produce bread. There must be bread at hand, or securable by the builders during the period of their building, else the work can not go on.

¹⁵ §3 of this Chapter (III).

The fact that subsistence must be available to make possible the prosecution of roundabout production may mean and probably does mean that there are at hand accumulations from the past. These accumulations will not be mainly, perhaps, stores of wheat, etc., from the last harvest (although in winter and spring such stores must be considerable) so much as accumulations of machinery, draft animals and buildings which facilitate production of wheat, etc., as needed. But whether roundabout production necessitates past saving or not, it certainly necessitates saving. The saving may be present saving of other members or classes of the community. Thus, the building of a factory for the manufacture of farm implements may be possible because the producers of wheat are raising more wheat than they can use, saving a part of the money derived from the sale, and investing this money in a company organized to manufacture agricultural machinery.

It will be advantageous to trace out in greater detail the interrelations of savers (who may or may not be laborers) and the laborers employed by the savings. The wheat raisers (assuming them to do the saving) produce wheat in excess of their own needs; they sell this excess on the market and it becomes a part of the stock¹⁶ of usable wealth of the community. The money they receive may be regarded as so many *tickets* entitling them to draw from this stock a value equal to what they have put in. But they do not spend all of

¹⁶ The concept here is that of a stock of wealth which is continually being drawn from and replenished.

this money in withdrawing consumption goods. A part of the money is saved. The saved money is invested in the stock or bonds of the agricultural machinery company (either directly or through the intermediation of a broker or a savings bank). The company then uses this money to hire labor to build its factory. The laborers employed to build, in spending their money for bread and other necessary or desired goods, are taking from society's stock and using up, the goods which the saved money represented.¹⁷ While doing this, however, they have produced a factory.¹⁸ Therefore the persons who did the saving and investing now have ownership in the factory instead of having had and enjoyed the other wealth which they might by now have consumed, had they chosen the alternative of not saving.

The same principle applies if, instead of adding new capital, the savers merely keep up the old capital. Thus, the owner of a shoe factory is

¹⁷On the hypothesis that the saved money is hoarded and not spent, prices will tend to fall, all the goods which the saved money represents may be consumed by others than the savers or their (indirect) employees, these others being able to buy more goods because prices are lower, and the stock of goods in society will not be increased by the saving. Then if, years after, the savers or their descendants endeavor to expend this money, prices will rise and the consumption of others will be curtailed. Those who have saved or their descendants or those for whose capital-producing labor they are paying, will consequently be securing consumable goods, not so much in direct exchange for the goods originally supplied by the savers to the social stock, as at the *expense* of other consumers of a later generation, at the expense of consumers who were not benefited by the original saving. (Cf. Davenport, *Economics of Enterprise*, New York—Macmillan—, 1913, pp. 338, 339).

¹⁸ See Mill, *Principles of Political Economy*, Book I, Chapter V, §5.

supposed to get from it, during its life, besides interest on its value, enough to replace it when it is too old for further use. But this involves saving of a replacement fund instead of spending for current enjoyment the entire receipts from the factory. In like manner the machines used are supposed to yield, on an average, enough to replace their value when they are worn out or when improvements necessitate scrapping them. A part of the shoes produced may be assumed to be used, directly or through their equivalents in other goods, to maintain the labor occupied in factory and machine replacement. The situation is not essentially dissimilar when the owner of the machines decides to shift his investment. He then does not replace these machines but uses their earnings in a corresponding way to provide for the construction of a different kind of machines or of some other form of capital, having uses of another sort. Past accumulations, then, with the exception of stocks of consumable goods which, because of the requirements of convenience or because of the seasonal character of their production, must be kept on hand, take largely such forms as buildings, roads and streets, railroads, bridges and ships, and machinery. (They also take, in part, the form of political connections and other means of exploitation.)¹⁹ The labor which is engaged in maintaining or in adding to any of this equipment is supported the more adequately because the accumulations of capital already made render industry more effective. Nevertheless, the

¹⁹ See §3 of this Chapter (III).

support of this labor comes immediately, in large part, from current product.²⁰ And the keeping of some labor thus occupied in maintaining or in increasing equipment means that a part of economic society is devoting a part of its purchasing power to such ends instead of consuming as much as its possession—or receipt of purchasing power—would enable it to consume.

The discussion of saving and investing has thus far seemed to establish the conclusion that savings take form as equipment goods by being turned over to laborers who, while consuming goods of the value of the sums saved, are at the same time producing equipment. But the amounts saved and thus devoted to the production of production goods, are not paid over solely to laborers as wages. *They are also paid over, in part, to land-owners as rent for the use of land applied to the production of capital, and to the owners of capital now in existence, as interest, in payment for the use of this capital in the production of other capital.* In short, the surplus production of goods which we have spoken of as savings, *is turned over to those who own or (in the case of their own labor) apply the various factors of production* and may be entirely consumed by these persons; but in due time there issues from the cooperation of these factors a stock of equipment goods of a value equal to the value of the savings consumed.

It appears, then, that roundabout production is gainful but that it involves provision of consumable

²⁰ Cf. Henry George, *Progress and Poverty*, Book I, Chapters III and IV.

goods to those who are engaged in (whose labor or whose property is devoted to) such production. This means that the persons who provide present goods for the consumption of those engaged in roundabout production must themselves defer or forego, in some degree, present consumption. They must "abstain" from consuming all that they might consume. Hence, abstaining or *abstinence*²¹ has been regarded as an element in capital construction, as a factor which must be taken account of in a theory of interest. It is to be recognized, of course, that a part of this abstinence may be undergone by the persons themselves who are engaged in roundabout production instead of by others who pay them, in which case those engaged in roundabout production come to be, to that extent, the owners of the capital they produce and claimants on its future yield. Evidently enough, addition to the capital equipment of society requires abstinence somewhere, and evidently, too, the mere maintaining of existing equipment, by replacing capital which wears out, involves abstinence from the consumption which might be enjoyed were such replacing not done.

Whether and how far the necessity of abstinence operates as a cause of interest must depend upon the extent to which it acts as a barrier to saving. If most of the people in the world—or in a relatively isolated community—were to abstain willingly from present consumption, devoting nearly all their productive effort to capital formation, the

²¹ See Senior, *Outlines of the Science of Political Economy*, fifth edition, pp. 58-60.

supply of machinery and other capital would be large, the gain from further increase of it would presumably be small, and the rate of interest would be low. The theorists who have endeavored to explain interest by reference to abstinence have regarded abstinence as a sacrifice to induce which a payment must be made. They have not attempted to deny that some saving would be done even with no interest payment and, in some cases, have taken pains to assert that a certain amount of saving would nevertheless be done.²² But they have urged that such saving is not enough to furnish all the capital that can be profitably used and that other capital can only be had by virtue of the receipt or expected receipt of a return upon it.²³ The "marginal" saver will not save unless compensated for so doing, and a man who would save something without interest will not save so much, will not save the "marginal"²⁴ dollar unless remunerated. When a person has already saved a considerable sum, has already denied himself a considerable amount of present income for the sake of larger future income, the better relative provision for his future than otherwise and the

²² See, for instance, Carver, *The Distribution of Wealth*, New York (Macmillan), 1904, pp. 232, 233.

²³ Ibid, pp. 235-245. Böhm-Bawerk, misinterpreting Carver, makes the latter say that interest is the *result of overendowment of the future (saving)*. See *Recent Literature on Interest*, translated by Professors Scott and Feilbogen, New York (Macmillan), 1903, pp. 56-62.

²⁴ "Marginal," above, means marginal when interest is paid. There would, of course, without interest or with it, be a margin of indifference, and hence a marginal saver and a marginal dollar saved. But the margins would be different.

poorer relative provision for present needs will tend to discourage further savings and to discourage them the more the greater are the savings which he has already made. As Professor Irving Fisher would put it, the time shape of his income stream (whether falling, level or rising) affects the individual's attitude towards saving, affects his degree of "impatience."²⁵ The millionaire does not have to practice abstinence, in the sense of making a sacrifice, to save large amounts. But marginal savings do involve sacrifice and will not be made without compensation. Interest, in this view, results from a shortage of savings, due to the fact that saving means sacrifice of present desires. We need not, here, defend the thesis that this sacrifice means "pain-cost." It suffices that there is a mental state which interferes with saving. In the fear that the word "abstinence" might connote pain-cost, some economists have preferred such terms as "waiting," "time-preference," or "impatience." The only essential fact for the purpose²⁶—if it be a fact—is that when the choice is made between spending and saving, the saver—at least some savers for some of their saving—would choose to spend were it not for the interest. The disinclination to save, so far as

²⁵ Fisher, *The Rate of Interest*, New York (Macmillan), 1907, pp. 95-98. Professor Fisher, however, will admit the abstinence theory only if abstinence be not regarded as a cost (Ibid, pp. 43-52).

²⁶ It is, however, interesting to note that Böhm-Bawerk, criticizing Marshall, and endeavoring to imagine a case in which there could be no "sacrifice" of abstinence, succeeded in imagining one in which the only possible comparison was of present labor and future commodity. See *Recent Literature on Interest*, pp. 41 and 42, footnote.

there is such a disinclination, can be in large part accounted for by the fact that, when choosing between present and future expenditures, the moment of choice is the present. When the future becomes the present and the observation of the two (if two) significant dates is made backwards in time, it may well be that there will appear to have been a "sacrifice" made if and when earlier consumption was preferred to later (now present consumption), even though such a choice seemed the desirable one when made. If, today, it causes regret—though it may not always do so—to plan for next year's instead of today's enjoyment, so, when next year becomes this year, it may cause us regret to realize that we chose to have our enjoyment last year and, therefore, can not have it now.

We should not hastily conclude, however, if and because there are some who will not save except at a high interest that high interest has, in general, the result of stimulating saving. That it does have this result has commonly been assumed by economists and is not here denied, but the certainty of its doing so is nevertheless to be questioned. There are undoubtedly some persons who would save more at a rather low rate of return on capital than at a somewhat higher rate.²⁷ Let us consider the case of a man who wishes to leave to his descendants an income of \$5,000 a year, which, in his view, will be sufficient to their needs. If interest is 10 per cent, an accumulated capital of \$50,000 will be sufficient

²⁷ See Cassel, *The Nature and Necessity of Interest*, pp. 146-148.

for his purpose. But if interest is 5 per cent, it will be necessary for him to save \$100,000 in order to leave the desired income to his family without the necessity of their at any time trenching on the capital.²⁸ He might actually save \$70,000 and have to expect some using up, by his family, of the saved funds.

That more saving would result or that as much saving would result from lower interest as from higher seems, however, not probable. In the first place, it is fairly likely that a person who would save \$100,000 when interest was 5 per cent, that his family might have a \$5,000 income would save *more than* \$50,000 if interest were 10%, considering the extra income which his family might thus secure as more than compensating the smaller relative sacrifice. Reversing the form of statement, we may say that few persons probably would, because of a lower interest rate, save an enough larger sum to yield the same annual income as they would expect to provide if the rate of interest were higher. There is, indeed, reason to doubt whether the average person would save as much in expectation of low interest as if there were prospects of large gains from the saving. Saving for old age and the saving which is done

²⁸ It should be unnecessary to point out that, even if this attitude were general, there would be a limit to the amount actually saved, and a rate of interest would result dependent upon the relation between the advantages of the use of capital and the disposition (or lack of disposition) to save. Though the supply curve of capital or waiting should slope backward, there would still, presumably, be some point of intersection with the demand curve, at which point interest would be determined.

through life insurance companies, would yield less return on the same investment. But let us consider the usually larger savings of those who endeavor to provide for their families permanent funded incomes. Will this type of saving not be discouraged? If we assume as an extreme limit a zero rate of interest, we have an hypothesis of a condition under which no return would be yielded on anything less than an infinite sum saved.²⁹ With no funded income within the realm of the attainable, might not some who now save large amounts, give up the idea of funded family fortunes, and live for the pleasures of each passing day? And in lesser degree might not a very low return, say 1 per cent, have a corresponding kind of effect?

In the second place, the possibility of interest being realized carries with it a sort of selection. Those who have the disposition to save soon find themselves realizing interest on their savings and thereby acquire additional ability to save. Those who have not the disposition to save are less likely to gain additional ability to save. The higher interest becomes, the more saving can be done by those who wish to save, and this fact suggests the likelihood of greater aggregate saving at higher interest than at lower.³⁰

²⁹ Mathematical processes give zero times infinity as indeterminate.

³⁰ Some one may reply that a higher interest means less capital, a lower productivity and hence lower wages, with decreased saving power of wage earners, even of wage earners who are most ambitious to save. But such an argument would entirely miss the point. The discussion above in the text has to do with the effect of interest on saving and calls attention to the fact that, other things equal, higher

In concluding this discussion it may not be amiss to call attention to the fact that the conditions necessary to induce saving might be very different in a socialist society in which private ownership of the means of production was prohibited than in an individualistic society. If saving is to take place in a democratically governed socialistic society, it is necessary that a *majority* be in favor of it. They must be willing that part of the society's current labor shall be devoted to the production of equipment for future needs even though the volume of goods available for current consumption is thus lessened. Where, on the other hand, saving is done by individuals, there will be *some* saving even if only one person out of ten or one person out of a hundred is willing to defer consumption.

interest means more saving in so far as it may add to the saving power of those who have the saving disposition. The criticism in question—if made—approaches the relations discussed, not from the direction of the effect of interest on saving, but from the direction of the effect of saving on interest. It assumes that the high interest which is, in the text, spoken of as probably a *cause of saving*, is a *result of lack of saving* and therefore of *lack of capital*; whereas for the problem under discussion the high interest which stimulates saving must be held to result from inventions or some other interest-raising cause not connected with a dearth of saving.

It may be admitted, in passing, that those who save are not always doing the wise thing nor those who spend, the foolish thing. Saving which is at the expense of good food, fresh air or rest, may diminish a man's working efficiency by more than the interest or earnings of the capital saved. It may, in some cases, make future saving more difficult than if the first saving had not been done. But we should hardly conclude that the great bulk of sums saved involve such offsetting losses.

§ 6

Summary

In this chapter our endeavor has been to discover the ultimate causes of interest, without, however, attempting an explanation of how these forces cooperate or how the exact rate of interest is determined. By way of preliminary, the factors of production were said to be land, labor and capital. We chose to include the work of the entrepreneur or enterpriser in the category of labor. Capital, it appeared in the course of the chapter, is not an ultimate factor of production but can be resolved into other factors. If we so resolve it, our ultimate factors are land, labor and waiting (or saving). The owner of land receives rent, the owner of capital receives interest (the return on waiting or saving), the laborer receives wages.

Capital is produced by labor applied to or on land, usually with the assistance of previously produced capital. Analysis showed that the advantage of using capital in production is really an advantage of applying available factors of production in a longer-time rather than a shorter-time process. Since capital is a derivative factor, we may, bearing in mind that labor is applied to or in cooperation with land, say that the advantage of using capital is an advantage of applying labor so as to bring a relatively remote reward as compared with applying it so as to secure a relatively early reward. Greater roundaboutness of production may mean the lapse of a greater period of time between effort and the enjoyment

of its results or it may mean an increase of the proportionate amounts of effort and of land the use of which is directed to securing comparatively distant gains.

It should be again emphasized, at this point, that capitalistic production is not always socially beneficial production and that capital is not always material technological equipment. The production of adulterated foods may be carried on capitalistically. And not only well-deserved goodwill, but also public favor due to sedulously propagated misinformation and governmental encouragement due to selfish political activity or even to bribery, may constitute part of a concern's capital. The seeking of such favor or encouragement means engaging in roundabout production. Nevertheless, though capitalistic processes *may be* anti-social and the returns received may be therefore unearned, it does not follow that such *must be* the case. In an ideal economic society, all such anti-social methods of wealth getting would be effectively prohibited and in such a society, therefore, no one could derive income from capital without so using it as to give a corresponding service to the community in return.

That all possible kinds of capital, and, therefore, all possible roundabout productions, yield a surplus over direct production was not asserted. But there seem to be enough roundabout applications of labor which do yield, or at least promise, a surplus over direct production, to occupy more of our effort and attention than we are willing to devote to the securing of deferred rewards. Nevertheless, roundabout production appears to yield less the farther

it is extended. There is, in this regard, a law of diminishing returns. To increase indefinitely the amount of labor and land devoted to capital production will not proportionately increase the gains from the use of capital. There comes to be a relative superfluity of capital. Nor, apparently, can the durability of capital instruments be indefinitely increased with indefinitely increasing advantage.

To say that roundabout production involves waiting is equivalent to saying that capitalistic production involves saving. In roundabout production capital is an intermediate stage between effort and its rewards. The production of capital and likewise its maintenance requires waiting or saving, requires a refraining from the present consumption which would otherwise be possible. The older economists spoke of this refraining as *abstinence*. Some modern economists speak of it as *waiting*. Others refer to *time-preference* or to *impatience*. Impatience or preference for present income over future income is not universal. The man whose present needs are fully supplied and who anticipates a needy future may definitely prefer future income to present. Even without prospect of surplus gain, many persons may eagerly save for old age or to provide funds for the support and education of their children who may become orphaned. But it is asserted that the sums saved would be less than they are were no surplus return securable by saving. The argument to this effect may not seem to everyone absolutely convincing. There may indeed be persons who would save more at a lower interest than at a higher.

On the whole it seems probable that the lure of a return on accumulated wealth is a real influence in increasing the amount of such wealth and that saving would be much less, the amount of capital less and, therefore, the amount of roundabout production less, if saving and roundabout production did not pay. However this may be, it seems clear that roundabout production does yield a surplus, that the amount of saving men are willing to do has not been sufficient to reduce the marginal gain or surplus to zero and that interest is an important fact in modern business life. The way in which capital productivity and the indisposition to save indefinitely, work together to produce a *rate* of interest will be considered in the next chapter.