The Distribution Of Wealth

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THE DISTRIBUTION OF WEALTH

BY

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PREFACE

TEN years ago, when the author began the teaching of political economy, the economic world was still engaged in a lively discussion of certain problems in distribution. This discussion had been precipitated a few years earlier by the writings of such men as Francis A. Walker and J. B. Clark in America, W. S. Jevons and Alfred Marshall in England, and a group of Austrian economists, notable among whom were F. von Wieser and E. von Böhm-Bawerk. The author had already, during his course of university study, taken an interest in this discussion, having contributed two articles to the *Quarterly Journal of Economics*, one in October, 1893, on "The Place of Abstinence in the Theory of Interest," and the other in July, 1894, on "The Theory of Wages adjusted to Recent Theories of Value." The interest thus developed has not declined, but increased during the subsequent ten years of active teaching, first in Oberlin College and afterward in Harvard University, and the present volume is the outcome.

The author hopes that the reader who takes up this volume may do so with the understanding that

economics is a science rather than a branch of polite literature, and with the expectation of putting as much mental effort into the reading of it as he would into the reading of a treatise on physics, chemistry, or biology. The collateral reading at the close of each chapter is not intended to be exhaustive, but is selected with a view to the needs of the author's own classes. Only so many references have been selected as a class could reasonably be required to read, together with the text, in a half-course, meeting three hours a week during a half-year.

So much has been written in the field of distribution that it would be impossible for any writer in this field to claim originality for all his ideas, and equally impossible for him to give full credit in every instance to all those to whom he is indebted. The present writer is led to believe, however, that there is enough of originality, both in his ideas and his manner of presentation, especially in the chapters on Diminishing Returns and Interest, to warrant the publication of the book.

No one is entitled to be heard on the subject of distribution who does not owe much to such works as Marshall's "Principles of Economics," Böhm-Bawerk's "Positive Theory of Capital," Taussig's "Wages and Capital," and Clark's "Distribution of Wealth." The author hereby acknowledges his in-

debtedness to these writers. He has also received many suggestions from the series of articles which have appeared in the various economic journals by such writers as F. Y. Edgeworth, Simon N. Patten, S. M. Macvane, Richard T. Ely, Irving Fisher, H. C. Emery, J. H. Hollander, C. A. Tuttle, F. B. Hawley, W. G. L. Taylor, and F. A. Fetter. He is also under obligations to his colleague, Professor C. J. Bullock, for his valuable suggestions and friendly criticism, and to Mrs. Laura Grant Folin for assistance in revising the manuscript and reading the proof. But the author owes most of all to his wife, whose many helpful suggestions, kindly criticism, and unfailing sympathy have not only made the preparation of this book possible, but were the inspiration of the years of study and preparation which preceded it.

T. N. C.

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INTRODUCTION

PROFESSOR MARSHALL has aptly defined economics as the study of man's actions in the ordinary business of life. Since the ordinary business of life consists in getting a living, it was easy to modify this definition so as to read, Economics is the study of man's efforts to get a living. Either of these definitions would imply that the science is concerned more with man's economic activities than with the things toward which those activities are directed; more with the ways of getting and using wealth than with the nature and forms of wealth. As a matter of fact, the student of economics cares only incidentally for a description and classification of the things which constitute wealth; but he wishes primarily to know the methods by which wealth is procured and utilized. In other words, economic activities, rather than economic goods, form the subject-matter of the science.

The reason for subdividing a science into departments is that it is easier to concentrate the attention upon a part of the subject than upon the whole. In

order to fulfil this purpose, the subdivision must be such that in each department some definite part of the subject-matter is set off by itself for special study. If economic goods formed the subject-matter of the science, it would have to be so subdivided that each department would study some particular class of goods. If economic conditions formed the subject-matter, each department would study some particular set of conditions. But if economic activities form the subject-matter, then each department must set off some particular class of activities for special study. In other words, the subdivision of economics should be based upon a classification of economic activities.

One very important group of economic activities is directed toward the production of goods. If this be broadly defined as the process of adding utilities to things, it will include not only the activities of the producer in the ordinary sense, but of the carrier, the storer, and the exchanger of goods. Another important group of activities consists in extracting the utilities from things, or in the consumption of goods. A third equally important group consists in the valuation of goods. No one of these groups is independent of the others, else we should have three separate sciences; but each is sufficiently distinct to permit of special study. At the same time these three groups

exhaust the category of economic activities, though each is capable of further subdivision.

These three classes of activities should therefore form the subjects of the three main divisions of the science, — production, consumption, valuation. The order in which these subjects should be treated and the subdivisions of each would depend upon the interests and the purposes of the individual writer. As a tentative suggestion as to the subdivision of the subject of valuation, the following outline is submitted: —

- Valuation
  - of goods
    - consumers' goods
    - producers' goods
      - land and natural agents
      - capital
      - laborers (only where slavery exists)
  - of services
    - of land and natural agents; or rent
    - of capital; or interest
    - of laborers; or wages
    - of business men; or profits.

The present work is primarily an attempt to explain the valuation of services, though a chapter on value in general is a necessary introduction to that explanation.

The writer would be the last to belittle the importance of the psychical side of economics; but the foregoing discussion will, it is hoped, help to make it clear that economics is not primarily a psychical

science. The psychical element predominates only in the department of valuation. It is obviously out of place here to open up the general question of the nature of the science; but it may be permissible to express the hope that economics may remain, as it always has been, a concrete science, whose aim is to explain the facts of economic life as they are seen and experienced, first in our own economic environment and afterward, perhaps, in the world at large. If this is to be the nature of the science, and if it is not to become an abstract theory whose aim is to follow the workings of a single principle under all possible conditions, then the words "static" and "dynamic" can not properly designate any of the main divisions of the science.

Economists who have passed out of the metaphysical stage of their mental development are content if they can find a satisfactory explanation of the facts of economic life which they see in the world about them. If they can find such an explanation, they are then in a position to explain how certain desirable modifications of these facts may be brought about for the advancement of the society in which they live, not pretending to a similar knowledge in regard to other types of civilization. Consequently, the present writer has not bothered himself with speculations as to what the primitive man may or may

not have done, nor even with the way in which Orientals of to-day, and other custom-bound peoples, may differ from our own people in their methods of evaluation. He has tried only to find out and explain why men evaluate things as they do in communities with which he is acquainted, in a civilization of which he is a part.

The method pursued is that of an analytical study of the motives which govern men in business and industrial life. No one who knows the meaning of terms will call this a metaphysical, or even a strictly deductive, method. We all observe certain concrete facts relating to the value of goods and services, and the economist tries to find the explanations for these facts. If the search for these explanations leads us to study the motives which govern men's actions in buying and selling, it only means that it is necessary to carry our study into the subjective, as well as into the objective, field. The study in one field may be quite as inductive as in the other, though there are certain facts of common experience which only need to be stated and do not require elaborate experimentation and research in order to find them out. Such facts are therefore taken for granted, but the analytical economist makes no more use of such facts than does the historian or the statistician, both of whom assume that they know certain things about the be-

havior of men and do not stop to prove them. The historian, for example, must assume that the men of past generations were moved by hunger and thirst, love and jealousy, self-interest and patriotism, just as the men of this generation are; but such is quite as violent an assumption as any which the analytical economist makes.

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CHAPTER I

VALUE

Moved by the primal instinct of acquisition, the boy with a pocket soon fills it with a collection of things which from time to time have served his purpose or pleased his fancy. As he advances in experience and knowledge of the world he gradually learns to distinguish in certain of these things a quality which makes them especially desirable. Things possessing this quality give him a peculiar power over his fellows — the power of securing from them certain of their possessions in peaceful and voluntary exchange. In other words, such things possess the advantage of being exchangeable for other desirable things. From this time forth his efforts are directed more and more toward the securing of things of this class, because he recognizes more and more the strategic advantage which comes to him through the possession of this soul-compelling power. With it he is able to com-

mand the resources of his fellows in peaceful and voluntary exchange.

This evolution which takes place in the juvenile mind is the counterpart of one which has taken place in society at large. In undeveloped societies, according to all accounts, each individual tries to make, gather, or otherwise secure, such things as will directly satisfy his own wants or those of his own family. But in all highly developed societies, especially in our own, the immediate concern of the individual is to make, gather, or otherwise secure the possession of, something which will bring him other things in exchange for itself. Having secured a thing of this kind, which he may not himself be able to use, he can depend upon getting something which he does want from among the possessions of his fellows.

A thing which possesses this power is said to be valuable, or to possess value. In Walker's brief but excellent phrase, "Value is power in exchange;"[1] and as Mill defines it, the value of a thing is "its general power of purchasing; the command which its possession gives over purchasable commodities in general."[2] Either definition accurately expresses the whole meaning of the word "value"; but in popular discussions this word is frequently and incorrectly

[1] "Political Economy," Part I, § 8.

[2] "Principles of Political Economy," Book III, Ch. 1, § 2.

confused with "utility." Utility is the power to satisfy a want or gratify a desire; but value is always and only the power to command other desirable things in peaceful and voluntary exchange. Value depends upon utility, since nothing could have value unless it had the power to satisfy some want or gratify some desire, — that is to say, unless it had utility; yet value is not the power to satisfy that want or to gratify that desire, but only the power to purchase other things. On the other hand, however useful a thing may be, however necessary it may be for our own comfort, or even for our existence, unless it has power in exchange it has no value. Air and sunlight and various other things possess utility, but they do not, under ordinary conditions, possess any value. Though there can be no value where there is no utility, yet there may be, and often is, utility where there is no value.

The price of an article, as so many writers on economics have explained, is merely its value expressed in terms of some single commodity which the community has generally agreed upon as a measure of value, which commodity is usually called money. Though this book is concerned primarily with problems of value, the word "price" will sometimes be used, but only where no confusion will result from using the words interchangeably.

Accepting "power in exchange" as a good work-

ing definition of value, the first problem is to explain the source of that power. Why do some things possess it while others do not? Why do some things possess more of it than others? Why does the same thing possess more of it at one time or place than at another?

Before attempting to answer these questions it is important that we should remind ourselves that they have to do with the value of real, concrete articles such as a hat, a loaf of bread, or a ton of coal, rather than with indefinite classes or groups of things, such as hats-in-general, bread-in-general, or coal-in-general. It is a prevailing vice of beginners in economics to be always trying to explain the value of things-in-general before they have adequately explained the value of particular articles. Men do not buy and sell things-in-general, but definite, concrete articles in specific quantities; not wheat-in-general, but bushels of wheat; not land-in-general, but acres of land; not gold-in-general, but ounces of gold. The fact that different bushels of wheat, or different ounces of gold, are so nearly alike as to make it a matter of indifference to the buyer which particular bushel, or which particular ounce, he gets, does not alter the case. The fact remains that a bushel of wheat or an ounce of gold is something tangible and concrete, and it is always a definite number of such tan-

gible, concrete units which are exchanged. Similarly, if such a thing as air were bought and sold, it would not be air-in-general, but cubic yards of air, or similar units.

To be sure, if the units are all alike, or so nearly alike as to serve the buyer's purpose equally well, they will all have the same price at the same time and place. Obviously, no buyer would pay more for one unit than he would have to pay for another if he knew that the cheaper unit would serve his purpose just as well. This is what Marshall has called the first law of the market.[1] Since all units of such a commodity have the same price, and since the price of any is a gauge of the price of every other, it is customary to speak of the price of the commodity without naming its units. Thus we uniformly speak of the price of bread, of wheat, of coal, etc. We even fall into the same habit of speech with respect to the price of things of the same class even when each individual unit has its own particular price. We speak, for example, of the price of houses, of land, of horses, etc. But this habit of speech does not alter the fact that value attaches only to concrete units; it merely implies (sometimes erroneously, however) that there is a close connection between the price of any one unit and that of every other unit of

[1] "Principles of Economics."

the class or group to which it belongs. Therefore we have first to explain why such a thing as a loaf of bread has value, and what determines the amount of that value. We will then have an explanation of the value of all bread of that kind and quality, since that which is true of one loaf would, under the same conditions, be true of every other. Similarly, after we have explained the absence of value in a given cubic yard of air, we shall have an adequate explanation of the absence of value in air-in-general, since that which is true of one cubic yard would, under similar conditions, be true of every other. Here as elsewhere the scientific method is to deal with particular facts first and general facts afterward.

That such a concrete article can have value only when some one happens to want it, is too obvious to need discussion. Manifestly, an article which no one wants will have no power to command others in peaceful and voluntary exchange. But if it is wanted by others besides its possessor, it will have value unless those who want it have nothing, not even services, to give in exchange for it. That the amount of value in such an article depends upon how much it is wanted in comparison with other things is perhaps a trifle less obvious but none the less true. That is to say, if it is much wanted in comparison with other things, many of those other things will be given in

exchange for it. In other words, it will have a high value. But if it is little wanted in comparison with other things, few of those other things will be given in exchange for it. In other words, it will have a low value.

There are two primary reasons why such an article may not be wanted at all. In the first place, there may be no use to which it can be put, no desire which it can possibly satisfy, at least so far as is known at the time and place. In the second place, though the article may have important uses, there may yet be available so many others just like it as to fully satisfy every desire to which it can minister. That being the case, the particular article in question would not be wanted.

The latter is the more general reason why a thing is not wanted, and why it is consequently valueless. It would be difficult to name anything which could not gratify some desire or be put to some use; but one could name an indefinite number of things which are superfluous, and are not wanted simply because there are too many others of the same kind. A cubic yard of air furnishes a good example of this kind of superfluity. Though it can be put to a use no less important than the sustaining of life itself, it is not wanted simply because there are ordinarily so many others available that the one in

question can be dispensed with just as well as not. Box it up and withhold it from use, and no one will care. By some miracle create another, and no one will be benefited. All this is true of any cubic yard one can designate: there is no want whose satisfaction depends in the slightest degree upon its existence; it might as well not be as be, so far as any one cares, and it is strictly accurate to say that no one wants it. Since this is true of each and every cubic yard, it follows that no cubic yard has any value. Thus we arrive at the explanation of the general fact that air has no value.

One might go a step farther and name a great many articles which, though capable of satisfying desires, or of being put to important uses, have yet become worse than worthless simply through their overabundance, or, more accurately, because there are so many other things just like them that they have become a nuisance. Many of the weeds which infest our fields belong in this class. Some have medicinal properties, others bear flowers which please the eye; but the number to be had so far exceeds the number which can be used that no one of them is wanted, while each and every one cumbers the ground and interferes with the growth of more useful plants. Hence the farmer will spend time and money in trying to get rid of them. Rabbits

in Australia will also serve as an illustration. Such things may be said to possess negative value, or to be worth less than nothing, because they are not only not wanted, but detested, and this solely because of their superabundance.

There are, to be sure, secondary reasons why an article may not be wanted, but these will be found to be only variations of the primary reasons already given. The article may, for example, not now be in a usable form, or this may not be a proper time for using it, or it may not be in a place where it can be used. Yet in the proper form, time, and place it might be very much wanted. If, however, the cost of putting it into that form, time, or place is so great as to more than balance the advantages which could be derived from it, no one will care to undertake to make the necessary changes. Under such conditions no one would want it in its present state, and it would therefore have no value.

This part of the discussion may be summed up by saying that an article — a concrete article such as may be bought and sold — has value only when it is wanted, and that it is wanted only where there are so few others like it as to only partially satisfy the want or the desire to which it ministers. If there are so many others like it that the want is fully satisfied, the one in question is not wanted

at all, and this would be true also of each and every one considered singly. But if there are not enough to go around and satisfy all who want it, each and every unit (of the same kind and quality) will be wanted and will consequently have a value.

If it is correct to say that such an article has value only when it is wanted, it is equally correct to say that it has little value when it is little wanted, and much value when it is much wanted, in comparison with other things. Following out the argument it would be easy to show that there are two primary reasons why such an article may be little wanted. In the first place, the uses to which it can be put may be trifling and insignificant, the wants to which it ministers may be of so little importance that there would be no great privation if they were left entirely unsatisfied. In the second place, though the wants to which it ministers may be of considerable importance, — that is to say, though there would be great privation if nothing could be had to satisfy them, — yet these wants may be so nearly satisfied by an abundance of other articles just like the one in question, or so nearly like it as to be good substitutes for it, that this particular article may not be much wanted. If it were withheld from use or destroyed, there would be no great

loss, and no great gain if another like it were created. Under these conditions comparatively few other things would be given in exchange for this one, or for any other of the same kind and quality. A man will usually give in exchange for a thing something which he wants less than he does that thing. But if the wants to which an article ministers are of considerable importance, and if there are few other articles to help satisfy those wants, then each and every such article will be much wanted, and a comparatively large number of other things will be given in exchange for it.

To say that an article has value only when it is wanted, is the same as saying that it has value only when it has utility, for utility is, by definition, the power to satisfy a want. Whether that want be fundamental, like hunger, or only whimsical, like the desire for the latest novelty, does not affect the case. Whether the want be commendable or blameworthy is likewise a matter of indifference so far as this question is concerned. Whatever the nature of the want may be, the power to satisfy it is called utility. The fact that an article is wanted, whatever the purpose may be, is sufficient. To say that an article has value only when there are not enough things like it to go around and satisfy all who want them, is the same as saying that it has value only when the class

to which it belongs is scarce, for scarcity is, by definition, insufficiency to satisfy wants. A thing may be rare, for example, without being scarce. That is to say, however little there may be of it, if that little is more than is wanted, it cannot be said to be scarce. On the other hand, however abundant it may be, if there is not enough, it is said to be scarce. Speaking absolutely, there may be more grass than weeds in any community, but relatively to wants, grass is scarce while weeds are superabundant.

Assuming only that things of any given class are appropriable and not, like the moon and the stars, beyond human control, it is safe to say that utility and scarcity, and these alone, are necessary to give them value. Where both qualities are present there is always value. Where either is lacking there is no value. The reader is hereby challenged to find an exception to this rule in any civilized community. Since the scarcity of an article implies that it is useful, one might go so far as to maintain that scarcity alone is necessary to give it value; but there is no advantage in carrying the discussion so far as that. Value not only depends upon utility and scarcity, but it varies with these two qualities. That is to say, the more useful a class of things becomes the greater their individual value, provided they do not increase in amount at the same time; and the scarcer

they become the greater their value, provided they do not decline in utility at the same time.

It has long been observed that whenever any commodity, or class of salable objects, becomes more abundant in comparison with other things, every unit of that commodity becomes less valuable, unless this increase in amount has been accompanied by some change in the habits or the wants of the community, which calls for more of the commodity. Similarly, if new uses are discovered for the commodity, or if more people come to desire it for any reason whatever, its value will tend to rise, provided its amount does not increase at the same time. This is, of course, nothing more than the well-known law of supply and demand, — a law which rests upon general observation and experience rather than economic analysis.

But this general observation is to be explained by means of another fact of common experience, — a fact which is itself so elementary as to need no explanation. I refer to the fact that the more fully a want is satisfied the less intense it becomes. Every boy knows that the first apple which he eats, at any one time, tastes better than the second, provided they are alike, and the second better than the third, and so on. He knows also that, however hungry for apples he may have been at the start, if the supply

of apples only holds out, he will ultimately have enough. In other words, he will reach a point of complete satisfaction so far as that particular want is concerned. When this point is reached apples will have lost their utility for him, for the time being, and the more nearly he approaches this point the less utility they will have, — that is, the less he will want them. Upon a class of facts so elementary as this is the law of value based, and this law governs, in the main, the industrial and commercial activities of society, and furnishes a basis for a large part of the science of economics.

The importance of these elementary facts relating to the satiability of wants will become perfectly evident if we will but consider two other facts: first, all industry is carried on for the purpose of satisfying wants; second, that which was said of the boy's appetite for apples can be said of every human want, viz., that it is satiable, and it becomes less intense as it approaches the point of satiety. This must not be interpreted to mean that the desire for wealth in general can be completely satisfied. Wealth is only a collective name for all the means of satisfying economic wants of every kind. If the desire for wealth is insatiable, it is because new wants arise as fast as the old ones are satisfied. It still remains true that any particular want, or the de-

sire for any particular commodity, is capable of being completely satiated, and the more nearly it approaches the point of satiety the less intense it becomes. Even such a desire as that for food or clothing may be difficult to satisfy for the reason that there are so many different kinds of food and clothing, and a desire for new kinds may develop as rapidly as the desire for the old kinds is satisfied. But this need cause us no difficulty if we remember that it is not food-in-general, nor clothing-in-general, but particular kinds of food and clothing for which there are market prices, and that the desire for any particular kind can be positively and completely satisfied.

This is sometimes called the principle of diminishing utility. The name is justified by the fact that utility is, by definition, the power to satisfy a want. Anything which satisfies a less intense want, or a given want in a less degree, has less utility than one which satisfies a more intense want, or a given want in a greater degree. If for any reason a given want declines in intensity, an article which helps to satisfy that want can be said to have less utility, or to furnish less satisfaction, than it did before the want declined, even though the article itself may have undergone no change whatever. At any rate, it is perfectly certain that it will be less wanted than it

would have been before. The fact that the article furnishes less satisfaction, whether by reason of some change in the thing itself, or of some change in the want to which it ministers, is a sufficient reason for not paying so much for it. This principle of diminishing utility, or diminishing satisfaction, furnishes a complete explanation of the observed fact that, other things equal, the value of a commodity falls as its supply increases and rises as its supply decreases. Obviously, the boy whose desire for apples is nearly satisfied will not be willing to give so much for an apple as he would if he were still hungry. If all the consumers of apples were in a similar state of comparative satisfaction, the sellers of apples would have to offer them at a low price or else keep them. But if their own desire for apples were also well satisfied, they would have no strong inducement to keep them, and they would consequently be willing to sell at a low price. This principle is of universal application, at least among all normally developed persons. The more nearly any one's desire for anything is satisfied the less he will be willing to give, as a consumer, for a given amount of that thing. Since this applies to every normal individual within the community, it must also apply to the community as a whole, and it therefore governs the market.

In addition to the fact that the individual's desire for a commodity declines in intensity as that desire approaches satiety, there is the fact that different individuals differ greatly in the range and intensity of their desires. Of a given commodity it may be true that a great many people do not want it at all, and those who do may differ greatly in the intensity with which they want it. They may differ also in the intensity with which they desire other things for which the commodity is exchangeable. In that case, if there is only a small supply of this commodity on the market, it will go to those who want it most in comparison with other things, — that is, to those who are willing to give the largest number of other things for it. But if the supply is increased, it must be sold at a price which will either tempt the original consumers to buy more of it, or tempt a new group to become consumers. From the social standpoint, this is only another phase of the principle of diminishing utility. For if the original consumers use the increased supply of the commodity, they will have to use it in the satisfaction of less intense wants, or the extra units consumed will yield them less satisfaction than did the original units. But if the increased supply is used by a new group of consumers, it will, in this case also, furnish less *relative* satisfaction, — that is, less satisfaction as

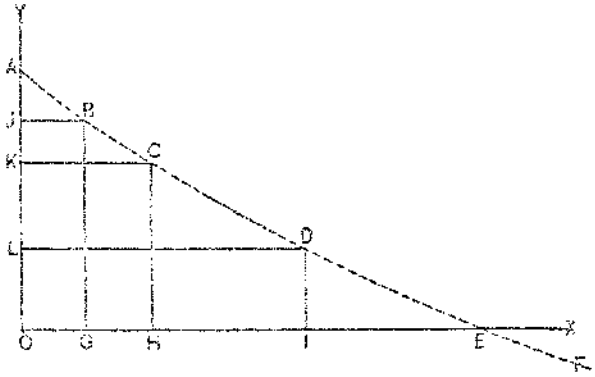
compared with that which other goods might furnish.

But there are commodities, such as watches, bicycles, automobiles, etc., of which the average individual desires only one unit. His desire for one may be very intense, but he may not care at all for a second (though he may desire a better one than he now has). But even in such cases the principle of diminishing utility applies in the social sense. Individuals differ greatly in their desire for such a commodity, and a small supply will go to those who want it most in comparison with other things, because they will offer most in exchange for it. A larger supply would have to be sold at a lower price if it were sold at all, in order to tempt a new group of consumers, who want it less in comparison with other things, to become buyers.

This principle of diminishing utility may be illustrated by means of the diagram on page 19.

Let us suppose that the amount of a given commodity, bread for example, in a given time and place, is measured along the horizontal line OX, while its utility, or want-satisfying power, is measured along the perpendicular line OY. Thus, if there were only one unit, say a loaf of bread, its utility would be represented, let us assume, by the line OA. But if the number of loaves should increase so that the

total amount would be represented by the line *OG*, the utility, or want-satisfying power of each loaf, would be somewhat less than before and would be represented, let us say, by the perpendicular line *GB*, or *OJ*. This, of course, assumes that there has been no corresponding increase in the number of persons wanting bread, or in the amount which each person



wants. Following out this plan, if the supply should increase to the point *H* or the point *I* in the line *OX*, the utility of each loaf would fall, let us say, to the point *K* or *L*, on the line *OY*, or be measured by the line *HC* or *ID*. At whatever point on the line *OX* the supply is cut short, the utility of each unit will be measured by the perpendicular distance from that point to the dotted curve *ABCDEF*, which may be called the *utility curve* of the commodity in question.

Accordingly, if the supply should reach the point *E*, each unit would become useless — considered by itself — like a cubic yard of air; while if the supply should increase beyond the point *E*, each unit would become worse than useless, like weeds and other nuisances which have a negative utility.

Though there is no known exception to the rule, that, other things equal, a want declines in intensity as the thing wanted is supplied in increasing quantities, it would be a mistake to assume that all wants decline at the same rate. As a matter of fact, different wants decline at very different rates. The desire for one thing, salt for example, may be a very intense one in the sense that it would be a great hardship to be deprived of it altogether, and yet a very little may suffice, while a very little more would become positively detrimental. The desire for another commodity, potatoes for example, may at first be no more intense, in the sense that it would be no greater hardship to be deprived altogether of potatoes than to be deprived of salt, and yet a much larger amount of this commodity may be consumed before the point of satiety is reached. In this case the want is said to be elastic, because it can adjust itself to great variations in the supply of the thing wanted. No severe hardship is felt if the supply is greatly reduced, and yet a considerable increase in the supply could be

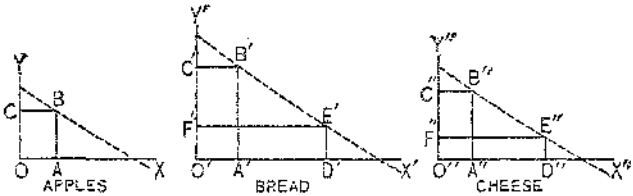
consumed without completely satisfying the want. In the former case, the want is said to be inelastic for the opposite reason. Returning to the diagram on page 19, an elastic want would be represented by drawing the utility curve *ABCDEF* so as to fall gradually toward the base line *OX*; while an inelastic want would be represented by drawing that curve so as to fall sharply toward the base line.

The principle of diminishing utility enables us to explain and account for some of the observed tendencies of the market relating to value, the most important of which is the one already mentioned, viz., that, *other things equal*, the value of any commodity rises when its supply decreases, and falls when its supply increases. But, it must also be observed, other things are not always equal. There may be any number of other changes going on at the same time, some of which will counteract, or completely offset, while others increase, the effect of the increase or decrease in the supply. For example, the population may be increasing or diminishing; the taste or desire for the commodity in question may be growing or declining; the supply of other things, for which the one in question is exchangeable, may be increasing or decreasing; or the taste or desire for any or all of these other things may be growing or declining. Any of these changes will affect the amount of other things

which will be offered in exchange for a given unit of the one in question because they will help to determine how much it is wanted *in comparison with other things*. That is to say, the value of a thing depends not alone on its supply, but in part upon its demand, since the demand for a thing depends partly upon the number of people who want it, partly upon how much each one wants it, partly upon how many other things he has which he can give in exchange for it, and partly upon how much he wants these other things.

That the demand for an article varies, other things equal, with the number of people wanting it is too obvious to need discussion. It is equally obvious that when each individual wants more of it than he did before, through some change of fashion or taste, the demand will, other things equal, increase, and *vice versa*. But the relation which the supply of other things bears to the demand for, and the value of, any given article may not be so obvious. It may be made clear, however, by reminding ourselves that the intensity of one's desire for those other things, as well as that of his desire for the one in question, depends partly upon how much he has of them. If they are supplied in such abundance that the desire for them is nearly satisfied, obviously a larger quantity of them will be given in exchange for a unit of

the commodity in question than would be given if they were scarcer and the desire for them not so nearly satisfied. When the others are abundant and the one is scarce, a given unit of the one will be much wanted in comparison with similar units of the others, and *vice versa*, given units of the others will be little wanted in comparison with a similar unit of the one. This may be illustrated by means of the following diagrams:—



Let the three figures be understood to represent the supply and the utility, or want-satisfying power, of apples, bread, and cheese, respectively, according to the interpretation of the diagram on page 19. Let us suppose that the supply of apples remains fixed, and that it is measured by the line OA, while the supplies of bread and cheese vary, that of bread being measured at one time by the line $O'A'$ and at another time by the line $O'D'$, and that of cheese at one time by line $O''A''$ and at another time by the line $O''D''$. Let it be further supposed that the dotted curves YBX, $Y'B'E'X'$, and $Y''B''E''X''$ are

the utility curves of apples, bread, and cheese, respectively. Then the utility of a unit — say a pound — of apples will be represented by the line AB. When the supplies of bread and cheese are measured by the lines $O'A'$ and $O''A''$, respectively, the utility of a pound of bread will be measured by the line $A'B'$, and that of a pound of cheese by the line $A''B''$. Under these conditions the utility, or want-satisfying power, of a pound of bread or a pound of cheese will be greater than that of a pound of apples, as shown by the fact that the lines $A'B'$ and $A''B''$ are each longer than the line AB. When this is the case, less than a pound of bread or cheese will be given in exchange for a pound of apples, which means that apples are less valuable than bread and cheese. But if the supply of bread should increase to the point D', and that of cheese to the point D'', the utility of a pound of the one would fall to the line $D'E'$, and that of a pound of the other to the line $D''E''$. Under these conditions the utility of each would be less than that of a pound of apples, as shown by the fact that the lines $D'E'$ and $D''E''$ are each shorter than the line AB. Consequently, more than a pound of either would be given in exchange for a pound of apples, which is the same as saying that apples would be more valuable than they.

The conclusions thus far reached may be summarized as follows: 1. An explanation of value must begin with concrete, tangible articles, rather than with whole groups or classes. 2. An article has value only when it is wanted. 3. It is wanted only when there are so few other things like it that the desire to which it ministers is not completely satisfied. 4. The amount of its value depends upon how much it is wanted in comparison with other things. 5. How much it is wanted depends upon how much the desire for it lacks of being completely satisfied. 6. How much it is wanted, *in comparison with other things*, depends partly upon how scarce those other things are, since all of the foregoing propositions apply also to each of them.

These conclusions all lead up to, and help to explain, the well-known law of supply and demand, which is that the value of a unit of any commodity depends upon the supply of the commodity and the demand for it, varying inversely with the supply and directly with the demand, the supply being defined as the amount on hand, or available at the time and place; and the demand being defined as the desire for the commodity, coupled with the ability to purchase it. Since the different units of the commodity, if they are all alike, will have to sell for the same amount at the same time and place, we

can rise to the conception of the value of the commodity as a whole, which is simply the sum of the values of its constituent units. Since such quantities as are out of reach, like the gold in the bowels of the earth, are not available for use, they form no part of the supply, as already defined. Neither, for the time, does wheat that is "cornered," nor does anything else thus artificially withheld from use. Since the ability to purchase a commodity implies the possession of other exchangeable things, it will readily be understood how this affects its value, or helps to determine how much it is wanted in comparison with other things. The law of supply and demand, as thus defined and explained, is the dominating law of the market in this commercial age, whatever may have been the law in other ages, or under other types of civilization.

If we have satisfied ourselves that a commodity has value only when there is a demand for it, and when the supply is insufficient to satisfy that demand, the next question to arise is, Why is the supply insufficient, or why are commodities scarce?

Of course the first and most obvious answer is that nature, unaided, does not provide them in sufficient abundance for the people who want them. Perhaps it would be more accurate to say that nature does not supply such things in the forms which are

needed, nor at the time when, and the place where, they are needed. This is as far back as we need to carry the inquiry. To try to carry it further would involve us in the discussion of such questions as, Why is the earth constituted as it is? Why are there so many people? or, Why do they want so many things? Accepting, therefore, as our starting-point, the indisputable fact that nature has not provided things enough to go around and satisfy the expanding wants of the human species, we have next to inquire how far, and under what conditions, it is possible to increase these natural supplies.[1]

There are a few things which can not now be increased by any human effort, and whose supplies are therefore absolutely fixed. Meteoric iron has

[1] It would be interesting, at this point, to turn aside from our main inquiry to consider the relation of this problem to some of the broader questions of sociology and philosophy. This insufficiency in the supply of usable things is the most important phase of the general fact that man is out of harmony with his environment. It must therefore be made the starting-point of any general inquiry into the laws of social development. From this insufficiency of goods arises the fact of unsatisfied wants, and of the fundamental antagonism of interests among mankind. This is the original and all-sufficient reason for the organization of systems of social control. Industry is merely the human method of restoring the harmony between the species and its environment, civilized man being the animal who succeeds largely in adapting his environment to himself, whereas other species must, in the main, be adapted to their environments, or live, if they succeed in living at all, forever out of harmony with it.

long served as a standard illustration of this class of goods. So far as present conditions are concerned, it would probably be fair to include, also, such things as rare curios, relics, autographs, manuscripts, etc., as well as ancient pieces of statuary and the paintings of old masters, though by more diligent search and the vigorous prosecution of the work of excavation, the world's available stock of some of these things may be appreciably increased. It might also be permissible to include land in this class, since the superficial area of the earth cannot be increased. However, certain small areas have been, and are still being, reclaimed from the sea and the desert, thus increasing in a small degree the available supply. This point will be more fully discussed in the chapter on the Rent of Land.

But the category of goods whose supplies are determined by nature, independently of human effort, is soon exhausted. By their industry men can and do increase the supply of nearly every class of commodities. If the value of an article is only great enough, men will usually find some way of reproducing it. In fact, most of the articles which figure on the market do not naturally exist at all in a usable form, and if they do so exist they are not found in the place where, or at the time when, they are wanted. In such cases the whole of the existing

supplies have come into the market because men have made the necessary efforts to bring them there. These efforts fall into one of three classes. First, those which change materials from a useless to a useful form, or from a less useful to a more useful form, as when a miller grinds wheat into flour; second, those which take materials from a place where they are not wanted to a place where they are wanted, or from a place where they are less wanted to a place where they are more wanted, as when a railroad carries wheat from Montana to Chicago; third, those which hold materials from a time when they are not wanted until a time when they are wanted, or from a time when they are less wanted until a time when they are more wanted, as when ice is stored in winter to be used in summer, or when wheat is collected after harvest and stored in elevators until called for by millers to supply the current demand for flour. It is, of course, unnecessary to add that men do not create materials. They only add to their utility, or render them more usable, in one, or all, of the three ways mentioned. This is what is meant by the production of goods, and it should be remembered that goods are not really produced until they are not only made into usable forms, but also brought to the places where, and kept until the times when, they are wanted. When materials

are thus made usable, the supply of goods is said to be increased.

Though nearly every commodity is supplied, or at least increased in quantity, by human effort, the amount of effort which is necessary to produce a given quantity, say a pound, of one commodity may be widely different from that which is necessary to produce the same quantity of another. It is, for example, much harder to produce a pound of gold than a pound of coal. When it requires a great deal of effort to produce an article, no one will ordinarily be tempted to make that effort unless the article has a great deal of value; but if it can be produced with a very little effort, men will be willing to make that effort even though the value of the article be correspondingly small. Speaking generally, an article must have value enough to persuade men to make whatever effort is necessary for its production, or it will not be produced at all. If for any reason the demand for gold should fall off until its value should fall to something like the value of coal, men would stop producing it because its value would not then pay them for their work. Gold would then grow scarcer, and this growing scarcity would ultimately give it a higher value. If its value should rise to a point which would again tempt men to undertake its production, this growing scarcity would be checked

by the new supplies which would be brought forth, and this, in turn, would check its rise in value. If, on the other hand, coal should, for any reason, acquire a value far higher than is necessary to tempt men to undertake its production, so many would then be led into the work of producing it (provided it were not monopolized) as to greatly increase its supply. But this increase in its supply would again bring down its value. Then if its value should fall to a point which would no longer tempt business enterprise, the increase in its supply would be checked, and this, in turn, would check its fall in price. Moreover, if its price should, for any reason, fall below its cost of production, men would stop producing it until its price rose to a remunerative point. The general result is, in the case of a reproducible commodity whose production is not monopolized, that its value bears a fairly close relation to the cost of producing it. That is to say, its value can not be permanently much above or below its cost of production.

The fact that the value of a commodity is, normally, about equal to its cost of production, has led a great many to the erroneous conclusion that it is its cost of production which gives it its value. This is probably the source of more error and confusion in economic discussions than any other mistake.

The fact is that value is always and everywhere due to utility and scarcity, and to these alone. Cost of production affects value only when, and so far as, it affects scarcity. As already pointed out, there are some things which have value though they can not be produced at any cost; and there are others which can not now be reproduced. Evidently the cost of producing an acre of land has nothing to do with its value, since the scarcity of land is determined independently of its cost of production. The same may be said of one of Raphael's Madonnas. But when a commodity is actually being produced by contemporary effort, it will usually happen that it will be scarce if it is hard to produce, for the simple reason that it will not be produced at all unless it is scarce enough to command a high price. On the other hand, if it is easy to produce, it will ordinarily be abundant for the reason that it will be produced until it becomes so abundant as to reduce the price to something like its cost of production.

Another popular form of this error is that labor creates value. Labor (together with enterprise and waiting) produces goods, — that is, it puts materials into usable form. But the same goods would have the same value even if they rained from the sky — provided only that they were equally scarce. A meteorite which falls from the sky is worth as

much as a similar piece of material excavated with great labor. On the other hand, no amount of labor expended in making an article which no one wants, or of which there is an overabundance, will give it any value. It would be more nearly accurate to say that labor is expended in the production of goods because such goods have value, or because it is known that they will have value when they are completed. But, of course, the truth which it is intended to state when it is said that labor creates value is that, in most cases, labor is necessary in order to put things into a form, place, or time in which they are wanted, or in which they will have value. Concerning the argument so often heard, that if there were no labor there would be no value, or very little of it, it is only necessary to say that if there were no land, or air, or sunlight, there would be no value. In fact, there are a number of agencies which are absolutely essential to the existence of value. But this does not prove that any one of these agencies is the creator of value. Some things increase in value, with time, and in these cases waiting is quite as essential as labor.

It seldom happens that all units of a given commodity are produced at a uniform cost. Some are produced under favorable, others under unfavor-

able, natural conditions; some by efficient, others by inefficient, men; and some by economical, others by uneconomical, methods. But however they may differ in cost, they will all, at any given time and place, sell for a uniform price,[1] provided they are alike. That is, if they are all equally desirable from the buyer's standpoint, they will all sell at the same price, regardless of differences in their cost of production. It is a matter of indifference to the buyer of a ton of coal whether it was mined near the surface or deep down in the earth, and whether it was mined with little labor by skilful methods or with great labor by unskilful methods. One ton is for him as good as another of the same quality, however they may differ in cost of production. But if two things are not equally desirable from the standpoint of the average buyer, they will differ in price, even though they cost the same. A pound of sirloin sells for more than a pound of shank, though one costs no more than the other.

Cost of production is, however, an effective check upon the supply of any product, even though there be a wide diversity in the cost of its different units. No part of the supply could long be maintained if it cost more than it was worth.

[1] This is market price as distinguished from peddler's price.

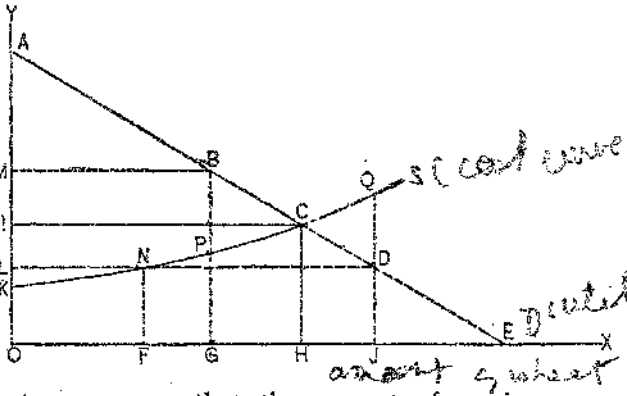
Consequently, the most expensive part of the supply can not, in the long run, cost more than the price which it brings. No one would continue producing an article under such unfavorable conditions as to lose money on it. If the commodity is one whose units are all of uniform quality, it will, as already pointed out, sell at a uniform price in the same market; but that uniform price must, in the long run, be as high as the cost of the most expensive part of the supply. If the price should fall so low as not to pay the cost of producing any part of the supply, some of the producers will go out of business, and production will thereby be curtailed and the supply reduced. But if the price should go so high as to more than pay the cost of the most expensive portions of the supply, it would tempt new producers into the field, and the supply would thereby be increased. Those portions of the supply which are produced under more favorable conditions and at a lower cost will therefore return a more or less permanent surplus to their producers. This profit is protected by the higher necessary cost of other portions of the supply, since the price can not fall below the cost of producing those other portions without stopping their production and therefore reducing the supply. What becomes of this profit will be discussed later.

The normal result of the price-making process is a kind of equilibrium[1] between the forces of demand and supply. This equilibrium is reached when the price is just low enough to induce buyers to take the whole supply, and yet just high enough to pay the cost of the most expensive portion and induce the producers to maintain the supply. Under these conditions the consumers are willing to buy the whole supply, but no more; and the producers are willing to furnish the whole supply, but no more. If, for any accidental reason, the price should fall below this point, the consumers would want more of the commodity than they had been getting; but the producers would not be willing to furnish so much, since some of them would be producing at a loss. On the other hand, if the price should rise above the equilibrium point, consumers would buy less of it than they had been using, but producers would be encouraged to produce more. In either case the market would become temporarily unbalanced — in the first case because consumers would want more of the commodity than was to be had, and in the second case because producers would be producing more than they could sell. But either circumstance would tend to restore the equilibrium.

[1] Cf. Marshall, "Principles of Economics," Book V.

If consumers want more than is to be had, they bid against one another and raise the price. If producers offer more than they can sell, they bid against one another, in the absence of monopoly, and thus lower the price. The price is therefore constantly seeking the equilibrium point, though, owing to the multitudinous disturbing influences and the constant changes in tastes and fashions, as well as in the methods of production, it is seldom stable. The water in a lake is constantly seeking a state of equilibrium, though it is never at rest.

The equilibrium of supply and demand may be further explained by means of the following diagram, which is but an elaboration of the one on page 19:—



Let us suppose that the amount of a given commodity is measured, as in the former diagram, along

the line *OX*, while its value and its cost are measured along the line *OY*. The descending curve *ABCDE*, which was called the utility curve in the former diagram, is here called the demand curve. The height of the various points on this curve above the base line *OX* is supposed to represent the price which varying quantities of the commodity would bring on the market. Thus, if the supply were measured by *OG*, the price would be measured by *BG*; if the supply were *OH*, the price would be *CH*; and if the supply were *OJ*, the price would be *DJ*. Similarly, the ascending curve *KNPCQ* is the cost curve, whose distance above the base line at various points represents the cost of producing the various parts of the supply. That is to say, some parts are produced at a cost as low as *OK*, others at a cost of *NF*, others at *CH*, and if so much as *OJ* were produced, some of it would cost as much as *QJ*.

But, as already pointed out, the price at which so large a supply would have to sell would be only *DJ*, thus entailing a loss on all the producers of that part of the supply represented by the line *FJ*. Some of these would certainly go out of business, or turn their attention to something else, with a resulting diminution of the supply. But if the supply should decrease until it was equal only to the line *OG*, the price, as already pointed out, would rise to the height of *BG*.

This is more than a remunerative price, since the most expensive part of this diminished supply would cost only *PG*. The large profits to be obtained from an increased production would then tempt new producers into the field (in the absence of monopoly), or tempt the old producers to increase their output, with a resulting increase in the supply and fall in price. But when the supply is measured by the line *OH*, the price would be represented by the line *CH*, which would also pay the cost of the most expensive portion. These conditions may be considered stable except as they are disturbed by new inventions and other changes in the methods of production, or by changes in taste or fashion on the side of consumption. Ruling out such disturbing factors, this supply can all be sold at a remunerative price, and yet not at a price which offers any inducement to try to increase the supply. But if less or more is produced, the conditions are necessarily unstable. If less is produced, the price will be greater than the cost, even of the most expensive part of the supply, and this will stimulate a larger production. But if more is produced, the price will fall below the cost of the most expensive portion of the supply, and this will drive some of the producers out of the field.

It is necessary at once to forestall a possible inference from the above diagram. Though the different

parts of any commodity are almost invariably produced at different costs, it is not to be inferred that the most expensive portion of a larger supply will necessarily cost more to produce than the most expensive portion of a smaller supply. Such an inference would probably be true in most cases where the increase in the supply is comparatively small, — too small to admit of any of the improvements and economies which sometimes accompany large-scale production, — and where the increase in the supply can not be secured by merely running the existing plants a little over time. In such cases the slightly larger production would merely bring into use a few less favorable situations and a few less practised workers than had formerly been employed. This would mean a larger cost for the additional supply, which cost would be represented by the line CQ. The same would be true in the cases of all such commodities as the leading agricultural products whose production has already reached the limits of the economy of large-scale production, — that is, where there is, so far as is now known, no further economy to be secured by a mere enlargement of the scale of production. In all such cases the diagram may be strictly interpreted. A larger supply of any such product requires the use of land, labor, or capital, which would not be necessary in the

case of a smaller supply. Ordinarily, only the better and cheaper land, labor, and capital would be used to produce the smaller supply, whereas inferior or more expensive factors would have to be called into use to produce the larger supply.

In the case of wheat, for example, there are three ways of increasing the product, leaving out of account possible new discoveries and inventions. (1) In the first place, land which is not now considered fit for cultivation could be used. (2) In the second place, land which is now considered more valuable for other purposes could be devoted to wheat growing. (3) In the third place, land which is now being used for wheat growing could be cultivated more intensively and made to yield a larger crop. But each of these methods is an expensive one. To grow wheat on land which was formerly too poor to cultivate is obviously expensive, for poor land means land which yields little in proportion to the cost of working it. To grow wheat on land which was formerly more valuable for other purposes would require the sacrifice of those other purposes. It would be expensive, to take an extreme case, to grow wheat on land which is worth $1000 an acre for market gardening. Such land is worth $1000 an acre for that purpose because of the large profit which its user can make in that business. To grow wheat

would require the sacrifice of those profits, and would not pay unless wheat rose to an enormously high price. And finally, to increase the product by the more intensive cultivation of the land now used for growing wheat would be expensive for two reasons. (*a*) Owing to the law of diminishing returns[1] the labor of increasing the product of a given piece of land increases more than in proportion to the product. (*b*) To cultivate the land more intensively requires more labor or capital, which could only be secured by making use of labor or capital now considered too poor to use, or by calling it out of other occupations where it was presumably worth more.

But there are many commodities whose production has not yet been enlarged to the most economical scale, and whose cost would therefore be less if they could be produced on a larger scale. Certain scientific instruments, for example, which would have only a limited sale, no matter how cheap they became, must necessarily be produced on a small scale. Such articles are often produced largely by hand, for the reason that it would not pay to construct expensive machines for that purpose. Machines can only be used to the best advantage when run at something like their full capacity. If they are used in the pro-

[1] See Chapter II.

duction of articles of this class, the cost of the articles will be high for the reason that the cost of the machines has to be divided among so few products. If there were a large market for such articles, so that it would be practicable to produce them on a large scale, machines would be constructed, and other economies introduced, which would greatly cheapen them. This has already been done in the manufacture of watches, and it is being done in the case of a number of other articles.

The most economical scale of production is one in which the producing establishments are not only as large as is consistent with the highest efficiency, but where each one is run at something like its full capacity. Even when a commodity is being produced in a series of establishments which are large enough to secure the maximum economy, it often happens that some of them are run at less than the most economical rate, or that some expensive parts of these establishments are allowed to remain idle a considerable part of the time. They may then, by running at a higher rate and keeping all parts busy, increase their output without a proportional increase in their expenses, in which case the additional output costs less per unit than the regular output. One large element in the cost of a manufactured commodity is the cost of the plant and the expense of keep-

ing it up. This cost is practically as great when the plant is run only a part of the time as when it is run all of the time. The original cost of the plant would be the same in either case, and it would deteriorate by going out of date just as rapidly, though the wear and tear would be a trifle less when it was run at less than its full capacity. When the output is small, the original cost of the plant has to be divided among a smaller number of units of product than when the output is large, which makes this element of cost greater per unit in the case of a small than in the case of a large output. Ordinarily the other elements in the cost, such as labor and raw materials, are no greater per unit when the output is large than when it is small. Of course, if the attempt were made to crowd the factory beyond its true capacity,[1] these elements of the cost would increase more than in proportion to the output, which would make them higher per unit of product. But up to this point an increase in the output reduces the cost per unit, since the cost of labor and raw materials and other running expenses are practically the same per unit, while the cost of the plant and other fixed charges are less per unit.

Let us suppose that the interest on the cost of the

[1] For a fuller explanation of the meaning of its true capacity, see Chapter II on Diminishing Returns.

establishment, plus the insurance, deterioration, and other fixed charges, amounts to $100,000 annually, while all the running expenses, including wages and cost of materials, amount to $200,000 when the establishment is turning out its full product, which is, let us say, 100,000 units. The total expense would then be $300,000, or $3 per unit of product. If, however, the establishment were to run on only half time, turning out only 50,000 units of product, its running expenses would be cut down one-half, making them $100,000; but the fixed charges would scarcely be affected at all, remaining practically at $100,000. The total expense of $200,000 would then have to be divided among the 50,000 units of product, making each unit cost $4.

When the production of any commodity has not reached its most economical scale, either because the producing establishments are not large enough or because they are not run at their full capacity, the equilibrium of demand and supply is extremely unstable. If the existing establishments are not large enough to secure the maximum efficiency, they are in constant danger of being driven out of business by newer and larger rivals who can produce at a lower cost simply because they are larger. If the market will not enable all the existing establishments to run at their full capacity, there is likely to ensue

a peculiarly fierce and deadly competition, especially in those industries where the fixed charges form an important element in the total cost of production. In a case of this kind, the establishment which sells enough of its product to enable it to run at something like its full capacity has an advantage over those which can not, in that it can produce cheaper than they. This situation usually results in a hard struggle for the market, accompanied by price cutting, discriminations, and other less scrupulous methods. Even those establishments which are beaten in the struggle and forced to produce at a higher cost because they are forced to run at less than their most economical rate, may still continue selling at a loss, since to stop producing altogether would involve a still greater loss. If they can sell what they produce at a price which will a little more than pay the running expenses, there will be something left over with which to pay part of the original cost of the plant, whereas to stop producing altogether would involve the loss of the whole original outlay unless the plant could be turned to some other use than the one for which it was first planned. For a commodity whose production is still in such a condition as this, there can be no true equilibrium of demand and supply, and no price which can really be said to be normal.

If the market demand is large enough to enable a considerable number of establishments of the most convenient size to run at their full capacity, the situation will usually adjust itself in time so that a true equilibrium, such as the diagram describes, will be reached. But if the market is necessarily so small that only a few such establishments can run, the tendency is toward monopoly. This comes about in one of two ways. In the first place, the larger and more economical establishments continue underselling and exterminating the smaller and less economical ones until, in process of time, only one or two large establishments are left in possession of the field. In this way the market becomes monopolized by the process of natural selection. In the second place, before the final stage in this process is reached, the few who have so far survived the struggle decide to stop the process of natural selection, so far as it threatens them with extermination, by uniting under one of the various forms of what is called a trust.

When the production of any commodity has become monopolized by these or any other methods, — and there are many kinds of monopoly, — a new factor is introduced into the price-making process. For this reason monopoly price is usually treated as in a class by itself. A monopoly, like any other indi-

vidual concern, aims to make as large profits as possible. In order to do this it must sell at that price which will yield it the largest total surplus above cost on the whole amount sold. In this it differs in no wise from other concerns; but there is this important difference in the conditions under which they sell. A concern which produces a commodity in which there is competition has its price fixed for it by its competitors. That is to say, the price which will yield it the largest total profits is practically the same as that at which all its competitors are selling, which in turn is fixed by the cost of producing the most expensive part of the normal supply. If it should try to sell at a higher price, its competitors would get most of its customers, and it would find itself doing business on such a small scale as to yield small profits. But the monopolist, on the other hand, does not have these precise conditions to face, since he has no competitors to sell the same commodity to his customers if his price goes too high. Nevertheless, there are producers of other commodities who are trying to sell their goods, and they will succeed in larger degree if his price goes too high. That is to say, consumers habitually take considerable latitude in their choice of purchases, and if the price of one thing does not suit them, they buy less of it and buy something else instead. This

gives some elasticity to the demand for the monopolized commodity, and for this reason alone the monopolist can not afford to put his price too high, lest his sales should be so reduced as to net him a smaller surplus on his whole business than he could make by selling more goods at a lower price.

In addition to the elasticity of the demand for the monopolized product, there is the further fact that monopolies are not always absolute. There is often a small residuum of competition — a few small producers who manage to survive through special advantages or superior managing ability. These put a more or less effective check upon the rapacity of the monopoly, forcing it to use a certain degree of moderation in fixing its prices. Nevertheless, the monopolist's power over prices is substantially greater than that of any individual producer in a competitive industry, and he is thereby frequently enabled to amass enormous profits. Even a slight rise in the price of the product may greatly increase the margin of profits. When a given article is being sold at a five per cent profit, an increase of five per cent in its price doubles the profit on each unit sold. Unless the sales are reduced one-half as the result of the high price, this means a substantial increase in the total profits.

The secret of the monopolist's power over prices is found in his control over the supply of the product.

Even he can not force his customers to buy more than they want, and they will choose to buy less and less as he puts the price higher and higher. In a competitive industry, where there is no control over supply, no individual producer wishes to cut down his production or to have a part of his product left on his hands. They will all therefore try to produce as much as they can sell at a price which will pay the cost of production with a reasonable margin of profit. The man who tries to sell higher will scarcely be able to sell at all. Cost of production is therefore, as has already been shown, the factor which controls the supply of the product of a competitive industry, and, indirectly, its price. But in the case of a monopoly, it is the will of the monopolist, calculating on the largest total of profits which controls the supply.

We have found that things have value only when they are scarce, and that there are three conditions which make them scarce. In the first place, their supply may be absolutely limited by nature and incapable of increase by any human effort. In the second place, they may be made scarce because men are not willing to produce them beyond the point which will give them a value equal to their cost of production. And in the third place, the production may be controlled by a monopoly which

limits the supply at a point which will give the product such a value as will yield the largest sum total of profits on the whole amount sold. The theory of value ought by this time to be reasonably clear so far as it relates to consumable commodities. A full understanding of the value of goods which are used for purposes of further production requires a further analysis of the factors which enter into the demand for them; but this analysis can be made to better advantage after we have made a study of the law of diminishing returns.

NOTE. — Professor Clark ("Distribution of Wealth," Ch. XVI) undertakes an ingenious correction of the marginal utility theory of value by pointing out that in each article there are various qualities, all of which are separately evaluated, and each of which has its marginal purchaser and its marginal utility. He further maintains that it is not the marginal utility of the article as a whole which determines its value, because no man is in the position of the marginal purchaser as respects all its qualities. Thus in the case of a canoe which contains the qualities of buoyancy, mobility, comfort, speed, and elegance, no individual buyer is likely to estimate each quality as the marginal buyer would. Buoyancy, for example, might be worth $500 to him if he could not get it for less, but there are so many things which can furnish buoyancy that the marginal utility of that quality to the community is only $2, and he can get it for that. He might value mobility at $300, but the supply of that quality makes its marginal utility and its price $5. For comfort he would pay $100, but he can get it for $10. Speed he would value at $75, but he can get it for $25, and for elegance he gives $30, being the marginal purchaser as respects that quality. Altogether he gives $72 for the canoe, which would have been worth more than $1000 to him if he could not have got it for less, and yet he was the marginal purchaser of one of its qualities.

It is doubtless true that such an analysis can be made of the average buyer's desire for an article, but that it is an important contribution to the theory of value cannot be admitted. It overlooks the fact that value is only power in exchange, and that the value of the canoe is only the number of other things for which it will exchange. When we consider that the buyer's desire for each of the other things which he gives up in exchange for the canoe can be similarly analyzed, it appears that he may not have realized so much surplus advantage over the cost of the canoe as the illustration seemed to make out. His desire for a bicycle, for example, may be analyzed into as many parts as his desire for a canoe, and by the same method it might be shown to be worth little less than $1000 to him. Then if he swaps a bicycle for a canoe he will be making no such gain as was assumed. Even when he pays money for the canoe he is giving up the chance of buying a bicycle or something else which he might otherwise have, and the same objection would apply to Professor Clark's contention.

As a matter of fact there is a marginal buyer for each *class* of canoes — some one to whom a canoe of that class is just worth buying — at any given price. If the price of the whole canoe is high, there will be few buyers; but if it is low, there will be many buyers. If there is a large number to be sold, the price must be put low enough to tempt a large number of buyers. Such staple commodities as wheat and coal are physically separated into classes and grades, and prices are quoted only for grades or classes. In the case of canoes and bicycles and similar articles, no such physical classification is made, but we must nevertheless make some sort of logical classification before we can accurately explain the price-making process.

COLLATERAL READING

W. S. Jevons, Theory of Political Economy, Chapters II–IV.

J. B. Clark, The Philosophy of Wealth, Chapter V.

Alfred Marshall, Principles of Economics, 4th Ed. Books III and V.

E. Böhm-Bawerk, Positive Theory of Capital, Book III.

CHAPTER II

DIMINISHING RETURNS

Ask any farmer you may happen to meet about the quality of his land, and unless his is an exceptional farm, he will tell you that it is not all alike, — that one field is more productive than the rest and will yield a larger or more valuable crop in proportion to the labor and capital expended in its cultivation. But if you were to advise him for that reason to put all his labor and capital on the superior field, letting the rest of his farm go to waste, he would certainly not take your advice, and he would think very poorly of your intelligence besides. Yet if one knew absolutely nothing about farming, and were possessed of the temerity which sometimes accompanies such ignorance, one might argue the matter with the farmer, reasoning somewhat as follows: if a certain amount of labor and capital on the more productive field will produce a more valuable crop than the same amount will produce if expended on a less productive field, it is a mistake to waste any labor and capital on the poorer land.

If, for example, one hundred days' labor (with the appropriate tools) on the best field will produce a crop worth $500, while the same amount of labor on any other part of the farm will produce a crop worth only $400, the farmer has only $900 for his two hundred days' labor. But if one hundred days' labor on the best field will produce a crop worth $500, two hundred days' labor on the same field ought to produce twice as big a crop, one worth $1000. Therefore the farmer loses $100 by putting half his labor on his inferior land.

If it were true that the second hundred days' labor on the best field would produce as much as the first hundred, or, to put it more accurately, if two hundred days' labor on that field would produce twice as much as one hundred, and three hundred days' labor three times as much, and so on indefinitely, the argument would be unanswerable, and the farmer would be very foolish not to follow your advice. Moreover, the community at large would be acting very unwisely in not concentrating all its energies upon a relatively small area of its best land. But the farmer knows perfectly well, and so does the community at large, that such is not the case,— that the produce of a given piece of land can not be doubled, trebled, quadrupled, and so on indefinitely by merely doubling, trebling, and quadrupling the amount of labor

and capital expended in its cultivation. In the case already assumed it is more probable that although one hundred days' labor would produce a crop worth $500, two hundred days on the same field would produce a crop worth only $800. In that case it would pay better by $100, under the conditions assumed, to put the second hundred days' labor on some other part of the farm. It is because the farmer, who is in the best position to judge, knows that such conditions are real that he does not concentrate all his energies on the small fraction of his farm which includes only his best land.

To say that the farmer knows better than to concentrate all his energies on his best land is the same as saying that he knows and acts upon one of the fundamental laws of economics, viz., the law of diminishing returns, though like the *Bourgeois Gentilhomme* who was astonished to find that he had been talking prose all his life, our farmer might be surprised to learn that he was acting upon an economic law. This law of diminishing returns is simply a part of the general observation that the product of any given piece of land does not, even under the same conditions of soil and season, bear a constant ratio to the amount of labor and capital used in producing it. That is to say, the product does not vary in the same proportion as the labor and capital, increasing in

proportion as they increase, and decreasing in proportion as they decrease. This simply means that there are several factors in the production of any crop, including labor, capital, and land, and that the amount of the crop is not determined by any one or any two of these factors, but by all of them combined. Labor and capital, being only a part of the factors, cannot alone determine the crop. It is well known to practical men that a niggardly application of labor and capital to a piece of land in the cultivation of any crop is little better than wasted, because it will produce so little in proportion to itself; whereas a more generous application will yield a crop not only larger, but larger in proportion to the amount of labor and capital employed. Up to this point the land is said to yield increasing returns to the labor and capital employed in its cultivation. But if the amount of these factors used in cultivating a given piece of land is still further increased, a point will eventually be reached where the product will no longer increase as fast as these factors are increased. Beyond this point the land is said to yield diminishing returns to the labor and capital employed. Though larger applications of labor and capital may continue to produce larger crops, the crops will not be so large in proportion to the labor and capital.

In growing such a specific crop as corn, for ex-

ample, a single day's labor of a man and team with the appropriate tools, if spread over a whole ten-acre field, would be thrown away because it would produce no crop at all. Five days on the same field might produce something of a crop, but it would be a poor one. Ten days would certainly produce more than twice as large a crop as 5, and 20 days' labor might possibly produce more than twice as much as 10. But 40 days' labor would hardly produce twice as much as 20, 80 would certainly not produce four times as much, and 200 days' labor would fall far short of producing ten times as much. If these assumptions are true of the particular field in question, it could be said to yield increasing returns up to the point where 20 days' labor were expended. Beyond that point it would be said to yield diminishing returns.

This may be further illustrated by means of Table A, which purports to show, in an assumed case, how much corn could be produced on a ten-acre field by using different amounts of labor and capital, the amounts being expressed in terms of days' labor of a man and team with the appropriate tools. The ratio between the product on the one hand and the labor and capital on the other is shown in the last column, which gives the amount of product, or the number of bushels produced, per day's labor.

TABLE A

Days' labor of man and team with tools	Total crop in bushels	Bushels per day's labor	
1	0	0	
5	50	10	Increasing returns.
10	150	15	
15	270	18	
20	380	19	
25	450	18	
30	510	17	Diminishing returns.
35	560	16	
40	600	15	
45	630	14	
50	650	13	

According to this table, as will be seen, increasing returns stop, and diminishing returns begin at the point where 20 days' labor are expended in the cultivation of the field.

TABLE B

Days' labor of man and team with tools	Total crop in bushels	Bushels per day's labor	
1	0	0	
5	40	8	Increasing returns.
10	130	13	
15	240	16	
20	300	15	
25	350	14	
30	390	13	Diminishing returns.
35	420	12	
40	440	11	
45	450	10	
50	455	9.1	

TABLE C

BASED ON TABLES A AND B

FIELD A			FIELD B			TOTAL	
Days		Bushels	Days		Bushels	Days	Bushels
10	producing	150 +	10	producing	130 =	20 producing	280
15	"	270 + 5	"		40 =	20 "	310
20	"	380 + 0	"		0 =	20 "	380
15	"	270 + 10	"		130 =	25 "	400
20	"	380 + 5	"		40 =	25 "	420
25	"	450 + 0	"		0 =	25 "	450
15	"	270 + 15	"		240 =	30 "	510
20	"	380 + 10	"		130 =	30 "	510
25	"	450 + 5	"		40 =	30 "	480
30	"	510 + 0	"		0 =	30 "	510
20	"	380 + 15	"		240 =	35 "	620
25	"	450 + 10	"		130 =	35 "	580
30	"	510 + 5	"		40 =	35 "	560
35	"	560 + 0	"		0 =	35 "	560
20	"	380 + 20	"		300 =	40 "	620
25	"	450 + 15	"		240 =	40 "	690
30	"	510 + 10	"		130 =	40 "	640
35	"	560 + 5	"		40 =	40 "	600
40	"	600 + 0	"		0 =	40 "	600
20	"	380 + 30	"		390 =	50 "	770
25	"	450 + 25	"		350 =	50 "	800
30	"	510 + 20	"		300 =	50 "	810
35	"	560 + 15	"		240 =	50 "	800
40	"	600 + 10	"		130 =	50 "	730
30	"	510 + 30	"		390 =	60 "	900
35	"	560 + 25	"		350 =	60 "	910
40	"	600 + 20	"		300 =	60 "	900
45	"	630 + 15	"		240 =	60 "	870

TABLE C.— *Continued*

Field A			Field B			Total		
Days		Bushels	Days		Bushels	Days		Bushels
35	producing	560 + 35	producing		420 = 70	producing		980
40	"	600 + 30	"		390 = 70	"		990
45	"	630 + 25	"		350 = 70	"		980
50	"	650 + 20	"		300 = 70	"		950

In any real case it would be impossible to tell, without putting it to a test, just at what point diminishing returns begin, though a capable farmer can tell, on the basis of his experience, closely enough for practical purposes. Whenever you find a competent farmer deliberately devoting a part of his labor and capital to the growing of any crop on more than one grade of land, you may be sure that he thinks it pays better to do so than to concentrate all his energies on his best land. But this could not possibly be true unless he had such an amount of these factors as would, if applied exclusively to his best land, carry its cultivation beyond the point of diminishing returns. If we may assume, for example, that Table A represents the amount of corn produced by varying amounts of labor and capital when applied to his best ten-acre field, and Table B the same for his second best ten-acre field, we shall find, by comparing the two tables, that if he had only 20 days' labor to use he would get more bushels

by concentrating them all on the best field than by dividing them between the two fields. Again, as shown in Table C, which is based on a comparison of Tables A and B, if he had only 25 days' labor at his disposal, there is no way in which he could divide them between the two fields so as to produce as many bushels as he could by putting them all on the best field. By this means he would get 450 bushels, whereas 20 days on field A and 5 on field B would give him only 420 bushels, while 15 days on field A and 10 on field B would give him only 400. However, when he has 30 days' labor at his disposal, it becomes a matter of indifference whether he concentrates them all on field A or divides them in the ratio of 15 to 15, or 20 on field A to 10 on field B, since each of the three methods would produce the same number of bushels, viz., 510. It is only when he has as many as 35 days' labor to use that it becomes positively to his advantage to divide them between the two fields. In this case the maximum number of bushels, viz., 620, is produced by dividing his days in the ratio of 20 in field A to 15 in field B. Having 40 days' labor, his maximum return, viz., 690 bushels, is secured by spending 25 days in field A and 15 in field B. Fifty days could be most profitably divided in the proportion of 30 on field A to 20 on field B,

60 in the proportion of 35 to 25, and 70 in the proportion of 40 to 30.

To the objection that these tables are artificial and based on assumed cases, it is only necessary to reply that the productivity of any real field, under varying expenditures of labor and capital, would necessarily conform to *some* table, and if that table revealed the principle of increasing and diminishing returns at all, everything which has been said of Tables A and B could be repeated regarding it. If it revealed indefinitely increasing returns, then it would be demonstrably uneconomical to use any field which is inferior to the one in question. It would be better to put all one's labor and capital on this field, allowing inferior fields to go to waste.

An analysis of these or any other tables which fairly represent the relative productivity of different pieces of land amounts to a demonstration of the rule that, in the growing of any particular crop, it can never be profitable to cultivate one's second best land unless one has such an amount of labor and capital as would, if used exclusively upon one's best land, carry its cultivation beyond the point of diminishing returns. This is, of course, equivalent to saying that if there were no such law as that of diminishing returns, it would never pay a farmer to devote any but a small area of his very best land

to the growing of any particular crop, putting all his labor and capital on that land. If any doubt remains upon this point, it may be effectively removed by constructing tables for two fields of different degrees of productivity, showing either constant or indefinitely increasing returns for each, and then trying to find some way of dividing any conceivable amount of labor and capital between the two fields so as to produce as much as could be produced by concentrating it all on the better field. If any final and conclusive proof of the law of diminishing returns were needed, it would be found in the fact that men of experience universally find it to their advantage to utilize lands of varying degrees of productivity in the cultivation of every crop. However, the law is so well known and generally recognized that such proof would not be needed, had not certain writers seen fit to deny it because it did not harmonize with their views of economics, and certain would-be reformers to ignore it because its recognition would interfere with the acceptance of their reforms.

This law of diminishing returns applies not only to agriculture, but to manufacturing and other industries as well, though there is a widespread opinion to the contrary. It must be remembered that the law of diminishing returns relates to the

amount which can be produced *on a given piece of land* by varying amounts of labor and capital. It means simply that, after a certain point, the amount that can be produced on any given piece of land does not increase in proportion to the labor and capital used. Obviously the same proposition holds true of manufacturing, though the point at which diminishing returns begin is somewhat further removed. That is to say, in the manufacturing of almost any article, more labor and capital could be concentrated upon a given piece of land before the law of diminishing returns begins to be encountered than could be used on the same land in the growing of most agricultural crops. But different crops permit of widely different applications of labor and capital, some of them being grown under such intensive systems of culture, where so much labor and capital are concentrated on such small areas of land as to bring them, in this respect, very near to certain classes of manufactures, for manufactures themselves vary in this respect.

In discussions of this subject, confusion has sometimes resulted from a failure to distinguish the law of diminishing returns from a somewhat similar law relating to the comparative economy of large and small scale production. It is, for example, sometimes stated that manufacturing is carried on under

the law of increasing returns, because a large factory can be run more economically, and turn out its products at a lower cost, than can a small one. But this is quite different from saying that a large factory can be run more economically than a small one on a given piece of land, or that it would not be necessary to use more land in connection with a large factory than with a small one of the same kind.[1]

Each business or industrial unit, such as a farm, a store, or a factory, is a combination, under one management, of various factors of production which are usually included under the three heads, — land, labor, and capital. Among the various questions which the manager of such a unit has to determine are the two following: 1. What is the best *proportion* in which to combine the various factors? 2. What is the best *size* for the whole business unit? The law of diminishing returns has to do only with the former of these questions. That is to say, it relates to the varying productivity of an industrial unit when the factors are combined in varying proportions. On the other hand, the law which relates to the comparative economy of large and small scale production has to do primarily with the size of the

[1] Cf. C. J. Bullock on "The Variation of Productive Forces," *Quarterly Journal of Economics*, August, 1902.

unit rather than the proportion in which the factors are combined.

The difference between these two laws can be expressed in a more compact form by means of the following formulæ, which are not to be understood as in any sense proving the existence of the laws, but only as expressing them in convenient form.

	Acres of land		Units of labor and capital		Product
I. If	X	with	Y	will produce	. . . . . P
II. Then	X	with	aY	will produce	more than aP (Increasing returns.) less than aP (Diminishing returns.)
III. And	aX	with	aY	will produce	more than aP (Increasing economy of large-scale production.) less than aP (Diminishing economy of large-scale production.)

It is assumed that a is a positive quantity greater than 1.

In formula II it will be observed, the *proportion* in which the factors are combined is not the same as in formula I, land remaining the same while labor and capital are increased by a. In formula III, however, the proportion is the same as in I, all the factors being increased in the same proportion; but the *size* of the whole combination is increased.

For the present we are concerned only with the law of diminishing returns, whose expression is:—

	Acres of land		Units of labor and capital		Product
1. If	X	with	Y	will produce	P,
2. then	X	with	aY	will produce more than P, but less than aP.	

This, as was shown in the earlier part of this chapter, is the condition which exists wherever men find it to their advantage to extend their cultivation to any but their best land.

Leaving out of account the increasing or decreasing economy of large-scale production, we may add the following:—

Acres of land		Units of labor and capital		Product
aX	with	aY	will produce	aP;

3. aX with aY will produce aP; since this reproduces the same proportion between labor and capital on the one hand and land on the other as was given in formula 1. Comparing 2 and 3, it is evident that, labor and capital remaining fixed, a variation in the land expressed by the ratio $aX : X$, will produce a variation in the product expressed by the ratio aP : a quantity greater than P but less than aP.

It appears that the product does not bear a constant ratio either to the labor and capital, *or to the land*. When the amount of land is left unchanged and the amount of labor and capital is increased, the product does not remain unchanged, nor does it increase as much as the labor and capital. And if the amount of labor and capital were to remain unchanged

while the amount of land were increased, the product would neither remain unchanged, nor would it increase so much as the land. From the above formula we may therefore derive the following: —

	Acres of land		Units of labor and capital		Product
If	X	with	Y	will produce . . .	P,
IV. then	aX	with	Y	will produce more than P, but less than aP.	

Thus the law of diminishing returns, originally applied to the product of a given amount of land under varying applications of labor and capital, is capable of being reversed and applied to the product of a given amount of labor and capital when applied to varying amounts of land. The principle is the same, and the expression is similar in both cases.

This can be reduced to arithmetical terms by referring to the table for field A on page 58. According to that table, when the amount of labor and capital was increased from 20 to 25 days, the product was increased from 380 to 450 bushels. An increase of one-fourth in the number of days brought an increase of something less than one-fifth in the number of bushels. But if we were now to keep the amount of labor and capital constant at 25 days and increase the amount of land by one-fourth, making 12½ acres, we should probably get a product of something like 475 bushels. If we leave out of

account the increasing or decreasing economy of large-scale production, as we might reasonably do if the variations were sufficiently small, 25 days on $12\frac{1}{2}$ acres would produce as much *per acre* as 20 days on 10 acres, since there would be the same amount of labor and capital *per acre* in both cases. But $12\frac{1}{2}$ acres at 38 bushels per acre (the amount produced on each acre when 20 days were spent on 10 acres) gives a total product of exactly 475 bushels. We find therefore that whereas 25 days on 10 acres produced 450 bushels, the same number of days on $12\frac{1}{2}$ acres would produce 475 bushels. In other words, an increase of one-fourth in the number of acres would bring an increase of only one-eighteenth in the number of bushels.

	Acres of land		Units of labor and capital		Product
When	10	with	25	would produce	450,
then	$11\frac{1}{4} \times 10$	with	25	would produce	$1\frac{1}{18} \times 450$.

But the principle can be still further extended by separating labor and capital and representing them as two factors, instead of lumping them together, as has been done thus far in the discussion. Indeed, there is every reason for so separating them, for labor and capital do not belong in the same class. They are no more alike than are labor and land, or capital and land. Moreover, if it is true that an

increase in the amount of labor and capital on the same amount of land will not increase the product as much as the labor and capital are increased, it is equally true, and for the same reasons, that an increase in the amount of labor on a fixed amount of land and capital, or an increase in the amount of capital used with a fixed amount of land and labor, will not increase the product as much as the variable factor in either case is increased. The statement can therefore be enlarged by adding the following formulæ to those given above:—

	Acres of land	Units of labor	Units of capital	Product
V. If	X with	Y with	Z will produce	P,
VI. then	X with	aY with	Z will produce more than P, but less than aP.	
VII. and	X with	Y with	aZ will produce more than P, but less than aP.	

Formula VI is an expression of the conditions which exist when an establishment, comprising a given amount of land and capital, is operated by varying amounts of labor. If the plant is undermanned, the product may be very small in proportion to the labor employed, whereas a larger amount of labor, being able to run the plant efficiently, might produce a more than proportionally increased product. But a point is soon reached at which the plant yields its maximum *per unit of labor*. This is where every laborer is most actively employed, with the

largest amount of machinery at his disposal which he is capable of handling. But the purpose of the management of such an establishment is not to get the largest product per unit of labor, but the largest product in proportion to the total cost of operation. This purpose is not fulfilled by merely working the plant at that rate which will yield the largest returns in proportion to the labor, unless the cost of labor is the only item of expense in the running of the establishment.

This may be further explained by referring again to the table on page 58. If an indefinite amount of land of the grade of that ten-acre field could be had absolutely free of cost, it would then pay the farmer to spread his labor over as much land as would enable him to put twenty days on each ten acres, since this is the proportion which, according to the table, yields him the largest product per day. Labor being the only item of expense, this ratio would also give him the largest product in proportion to the total expense of his farming. But if he had to pay a rent per acre equal to the price of 20 bushels of corn, he would then find it to his advantage to use less land, putting 30 days, instead of 20, on each 10 acres. If we may assume that rent and wages are the only items of expense, we will find that, according to the table, if he uses only 20 days on each 10 acres

he will have left, after paying his rent, only 9 bushels for each day's labor, whereas if he were to use 30 days on each 10 acres, he would have left 10⅓ bushels per day. Under these conditions, this is the ratio of labor to land which would yield the largest product in proportion to the total expenses. On the other hand, if we could conceive of a condition where rent would be the only item of expense to the farmer, labor being absolutely free and unlimited in quantity, it would then pay him best to use as much labor with each acre as would yield the maximum crop *per acre*. Since the total expense of farming would then consist in rent, this system of farming would yield the maximum product in proportion to the total expense.

We must conclude, therefore, that if land were free and labor expensive, it would be most profitable to combine them in that proportion which would yield the largest product per unit of labor, which would require an extensive system of farming. On the other hand, if labor were free and land expensive, the most profitable combination would be the one which would yield the largest product per unit of land, which would require very intensive farming. Where both land and labor are expensive, the most profitable proportion must lie somewhere between these two extremes, depending upon the relative

expensiveness of the two factors. That is to say, where land is dear and labor cheap, the tendency is toward intensive cultivation; but where labor is dear and land cheap, the tendency is, for equally good reasons, toward extensive cultivation. In the real world where labor is always more or less expensive, land is never profitably cultivated up to that point which will force it to yield its maximum product per acre, and only in extremely new countries where land is free is it ever profitable to cultivate it so extensively as to yield the maximum per unit of labor.

Since so much labor is never profitably used in connection with a given amount of land as to produce the maximum *per acre*, it follows that, in any normal case, an increase in the amount of labor on such given amount of land will always increase the gross product. But since so little labor is never profitably used in connection with a given amount of land as to produce the maximum *per unit of labor*, it follows that an increase in the amount of labor on a given amount of land will never, in any normal case, increase the product as much as the labor is increased. That is to say, except on the frontier it always pays to cultivate land beyond the point where diminishing returns begin, if it pays to cultivate it at all, but it never pays to cultivate it up to the point where an increase in the labor would yield no increase in the gross product.

Similarly, since so much land is never profitably used in connection with a given amount of labor as to produce the maximum *per unit of labor*, it follows that, in any normal case, an increase in the amount of land with such given amount of labor will always increase the gross product. But since so little land is never profitably used in connection with a given amount of labor as to produce the maximum *per unit of land*, it follows that, in any normal case, an increase in the land with such given amount of labor will not increase the product as much as the land is increased. This is merely a reversed application of the law of diminishing returns as originally expounded, and it is a necessary corollary of that law. It is, moreover, the condition expressed by formula IV.

All this is as true of a factory as of a farm, and, by a change of terms, all that has been said of the ratio between farm land and the labor which cultivates it could be repeated of the ratio between a manufacturing plant and the labor which operates it. So much labor is never profitably used in connection with such a plant as to turn out the maximum product, nor is so much land and capital ever profitably used in connection with a given amount of labor as to turn out its maximum product per unit of labor. That is, it is always possible, in any normal

case, to force a somewhat larger product by using more labor in connection with a given amount of land and capital, or more land and capital with a given amount of labor. But, on the other hand, so little labor is never profitably used in connection with such a plant as to yield the largest product per unit of labor, nor is so little land and capital used as to yield the maximum per unit of land and capital. That is, though an increase in the amount either of labor or of land and capital would increase the gross product, it would never, in any normal case, increase the product as much as the labor or the land and capital are increased. Therefore, we have here also all the essential features of the law of diminishing returns as it was originally expounded, the only difference being that we are here considering the productivity of a fixed amount of land and capital when combined with varying amounts of labor, instead of the productivity of a fixed amount of land when combined with varying amounts of labor and capital. This is (to repeat) the condition expressed in formula VI.

Formula VII is an expression of the law which governs any establishment or business unit which combines a fixed amount of land and labor with varying amounts of capital. By a change of terms, the explanation which was given of formula VI

can be adapted to this one, since the same law applies to this as to other variations in the proportion in which the factors are combined. That is to say, an increase in the amount of capital used in any typical establishment (land and labor remaining the same) will increase the total product, but not as much as the capital is increased. On the other hand, allowing the capital to remain the same, an increase in the labor and the land will also increase the total product, but not as much as the labor and land are increased.

We are therefore driven to the conclusion that there is one law which governs the results of every variation of the proportion in which the productive factors are combined, no matter which factor is varied. It never pays to combine so little of any one factor with so much of the others as to get the largest possible product in proportion to the one, unless the others are absolutely free and do not need to be economized, in which case they pass over into the class of non-economic factors like air and sunlight. This is equivalent to saying that, where each factor costs something, it always pays to combine them in such proportions that if any one or two of them were increased it would increase the product, but not so much as the variable factor, or factors, were increased. In every normal case,

therefore, where the factors are wisely combined, a law of diminishing returns operates with respect to each of the factors, and not with respect to one alone.

But what is the most profitable proportion in which to combine the various factors of production? As already suggested, this depends upon their relative cost. The more expensive one factor is in comparison with the others the more necessary it is to economize in the use of that one. There are, for example, several ways to grow a hundred bushels of corn. One is, to use much labor with little land, making the land produce a heavy crop, but getting a small product per unit of labor. Another is to use little labor with much land, getting a comparatively light crop from the land, but enabling the labor to produce a larger amount per unit. Which is the more economical of these two ways will depend upon the relative cost of land and labor. Where land is dear and labor cheap, the former is the better method; but where land is cheap and labor dear, the latter method is better. There are also several ways of producing a hundred yards of cloth. One is to use much labor with little machinery, driving the machinery at a high rate of speed and making it turn out a large product, but getting a comparatively small product per unit of labor. Another is to use little

labor with much machinery, enabling the labor to work efficiently and turn out a large product per unit, but getting a comparatively small product per machine. Here again, the question as to the more economical method depends upon the relative cost of the two factors.

The general rule may be laid down that, with a given amount of land or capital, it pays best to combine that amount of labor which will just enable any unit to add as much to the total product as that unit costs. For a fuller explanation it is necessary to refer again to the table on p. 58. As the amount of labor used on this field increases beyond 20 days, there is a smaller product per day, but more than that, there is a still smaller *additional* product created by each additional increment of labor. When the labor increases from 20 to 25 days, the product increases from 380 to 450 bushels, making an additional product of 70 bushels resulting from the addition of 5 days' labor to the existing force. Each of the additional 5 days, therefore, added 14 bushels to the product, though the average product per day for the whole 25 days was 18 bushels. This additional product of 14 bushels is sometimes technically called the *marginal* product, or the product of the marginal labor, to distinguish it from the average product or the product of the average labor. Again,

when the labor is increased to 30 days, the total product is increased from 450 to 510 bushels. This increase of 5 days brought an increase of 60 bushels in the crop, making an additional, or marginal, product of 12 bushels per day, though the average product for the whole 30 days is 17 bushels. When the labor is again increased from 30 to 35 days, the crop is increased by 50 bushels, making a marginal product of 10 bushels. The marginal product continues falling with each increase in the amount of labor, until finally, when the labor is increased from 45 to 50 days, the total product is increased by only 20 bushels, making a marginal product of only 4 bushels.

Now if the price of a day's labor, such as is here contemplated, were equal to the price of 11 bushels of corn, it would not pay the farmer of this land so well to hire 50 days' labor as it would to hire 45. Fifty days would cost him 55 bushels more than 45 days would cost, and would produce only 20 bushels more. The extra 5 days would net him a loss of 35 bushels. On the other hand, it would not pay him to stop with only 25 days. Thirty days would cost him only 55 bushels more, but they would produce 60 bushels more. He would therefore make a net gain of 5 bushels by hiring the extra 5 days. But it would not pay him to hire 35 days' labor, because they would only produce 50 bushels more than 30

days would produce, and he would therefore lose 5 bushels on the extra 5 days. At the assumed price of labor, 30 days would be the most profitable application of labor to this land. But if a day's labor cost only the price of 9 bushels, 35 days would pay better than 30, because they would cost only 45 bushels more, and would produce 50 bushels more. In short, it always pays best to apply to this or any other piece of land as much labor as will yield a marginal product approximately equal to its cost per unit, whatever that cost may be.

The same principle will determine the amount of land which ought to be used with a fixed amount of labor (and capital). If a farmer has a certain amount of labor at his disposal which he must use or allow to go to waste, he will find it to his advantage to use as much land as will enable each acre to add as much to the total crop as it costs per year. That is to say, the marginal product of the land should just equal its rent. Let us assume that he has 50 days' labor, such as is assumed in Table A, and that he is in doubt as to how much land, of the grade described in the same table, he ought to cultivate with that labor. If he should use it all in the cultivation of 10 acres of corn, he would get, according to the table, a total crop of 650 bushels. But if he should cultivate 11⅓ acres, he ought, according to

the same table, to get a total crop of 700 bushels. Fifty days' labor would cultivate $11\frac{1}{9}$ acres with the same degree of intensity as 45 days would cultivate 10 acres, since the ratio of labor to land would be the same in both cases.[1] $45 : 10 :: 50 : 11\frac{1}{9}$. Ten acres cultivated at that degree of intensity produced a crop of 630 bushels, and $11\frac{1}{9}$ acres cultivated at the same degree of intensity ought to produce a crop of 700 bushels. $10 : 630 :: 11\frac{1}{9} : 700$. The addition of $1\frac{1}{9}$ acres, therefore, would produce an *additional* crop of 50 bushels, which makes a marginal product of 45 bushels per acre.

Now, if the farmer could get his land at a lower rental than 45 bushels per acre, it would pay him better to rent $11\frac{1}{2}$ acres than 10. But if the rent per acre just equalled the price of 45 bushels, it would be a matter of indifference to him, since in either case he would have the same amount left, viz., 200 bushels, or 4 bushels per day, to pay him for his labor. But if he had to pay only 36 bushels per acre as rent, it would be a matter of indifference to him whether he cultivated $11\frac{1}{9}$ or $12\frac{1}{2}$ acres with his 50 days' labor. If he should cultivate $12\frac{1}{2}$ acres, he ought to produce as much per acre as 40 days could produce on 10

[1] This, of course, leaves out of account a possible increase or decrease in the economy of large-scale production.

acres. 40 : 10 :: 50 : $12\frac{1}{2}$. Since, according to the table, 40 days on 10 acres produced 600 bushels, 50 days on $12\frac{1}{2}$ acres ought to produce 750 bushels. 10 : 600 :: $12\frac{1}{2}$: 750.

As we saw in the preceding paragraph that 50 days on $11\frac{1}{9}$ acres produced 700 bushels, and as we have now found that the same amount of labor on $12\frac{1}{2}$ acres would produce 750 bushels, it appears that the addition of $1\frac{7}{8}$ acres to the combination added 50 bushels to the product. This makes a marginal product of 36 bushels per acre.

By a study of the following table, which is derived from Table A, it can easily be determined, approximately, how many acres of this kind of land the farmer in question could afford to cultivate at any given rental between 10 and 45 bushels per acre.

TABLE D

Number of acres cultivated by 50 days' labor	Total product	Number of acres added each time	Marginal product per acre
10	650		
$11\frac{1}{9}$	700	$1\frac{1}{8}$	45
$12\frac{1}{2}$	750	$1\frac{7}{8}$	36
$14\frac{2}{7}$	800	$1\frac{11}{28}$	28
$16\frac{2}{3}$	850	$2\frac{5}{21}$	21
20	900	$3\frac{1}{3}$	15
25	950	5	10

This table has been partly explained already. The product of 50 days on 10 acres was taken bodily from Table A. The product of the same number of days on the various quantities of land named in the first column is found by the process of simple proportion. In Table A was given the product of 10 acres when cultivated by varying amounts of labor. By increasing the number of acres to be cultivated by 50 days' labor, so as to reproduce the proportions between labor and land which were given in Table A, it is easy to calculate the total product in each case. The marginal product is found by dividing the additional product in each case by the additional acres which it took to produce it.

In the foregoing illustration, labor and capital have been treated as one factor, or rather, capital has been merged with labor — this for the purpose of reducing the number of factors and simplifying the illustration. But the same reasoning would apply to an illustration where land and capital were treated as a single factor in the form of an industrial plant, — whether a farm or a factory would make no difference. With a given industrial plant, consisting of a fixed amount of land, buildings, and machinery, the most profitable application of labor would be that which would make the marginal

product of labor just equal to its cost per unit. This is what is meant by running such a plant at its true capacity.[1] This could be shown by constructing another table on the plan of Table A, or even by changing the headings of the columns of that table. We might, for example, let the first column represent the varying numbers (in hundreds) of laborers who might be employed in a shoe factory, and let the second column represent the numbers of shoes produced in a given time. The third column would then represent the number produced per laborer in that time. The reader can determine for himself, by the method outlined above, what would be, in this assumed case, the most profitable number of laborers to employ at any given rate of wages. The chief difficulty with this illustration is that it assumes a uniform rate of wages for the various laborers employed in such an establishment; but this will be considered later. Then by changing the headings of the columns in Table D, it could be determined, theoretically, how much land and capital to use with a given amount of labor in the manufacture of shoes.

We have not yet reached a good stopping-place in our extension of the principle of diminishing returns.

[1] See Chapter I, p. 39.

The grouping of the factors of production into the three classes, labor, land, and capital, is by no means final. There are various kinds of labor, of land, and of capital. Two different kinds of labor may be performing functions which differ almost as widely as those performed by labor and capital, or by labor and land. The work of a bookkeeper differs as widely from that of a ditch digger, as that of a ditch digger does from that of a steam shovel. Therefore, the same reasons which favor the separation of labor and capital, in order that they may be treated as distinct factors, will also favor the separation of one kind of labor from another, of one kind of capital from another, and of one kind of land from another. Let us assume that in a given industrial unit, say a factory, one kind of labor is varied in amount, while the land, capital, and other kinds of labor remain the same. The product of the factory will not vary in exact proportion to the variation in the amount of the one kind of labor, nor will it remain unchanged as though entirely unaffected by variations in this kind of labor. Here we have every essential feature of the law of diminishing returns as it was originally developed. This extension of the law is capable of an indefinite number of applications. Instead of assuming a variation in one kind of labor, as in the above illustration, we may assume a variation in the

amount of any other kind of labor, of any kind of capital, or of any kind of land.

A complete formula which should show every possible application of this extension of the law of diminishing returns would require a separate term for each and every kind of labor, capital, and land. But such a formula would be long and unwieldy. The following simple formula, though incomplete, will have to suffice.

	Units of any one kind of labor, land, or capital		Amount of all other factors combined		Product
VIII. If	X	with	Y	will produce	P,
IX. then	aX	with	Y	will produce more than P, but less than aP,	
X. and	X	with	aY	will produce more than P, but less than aP,	

Formula IX is an expression of the conditions which exist in any large and complex establishment which combines many kinds of labor and capital — possibly of land also. Let us take a railroad as an example. With a given road-bed, and with a given equipment in the way of depots, offices, machine shops, etc., and with a given labor force, an increase in the rolling stock will, between rather wide limits, enable the road to carry more freight and passengers, but this increase in its capacity will not be proportional to the increase in the rolling stock. That is to

say, unless the road were so abundantly equipped with engines and cars that absolutely no more could be conveniently handled by the existing force on the existing tracks, such an increase would enlarge its carrying capacity. But such an over-equipment of rolling stock would be similar to the case of a farm which combined so much labor and capital on a given piece of land as to get the maximum product per acre, which, as we have already seen, would not be the most profitable proportion unless labor and capital could be had entirely free of cost. And unless the road were so poorly equipped with rolling stock that each engine and car could be worked up to the absolute limit of its capacity, an increase in the rolling stock would not proportionally increase the carrying capacity of the road. But such an under-equipment of rolling stock would be similar to a farm which employed so little labor and capital in proportion to the land as to get the maximum product per unit of labor and capital, which would not be the most economical proportion unless the land could be had absolutely free of cost. Unless, therefore, the road were equipped as though rolling stock formed no part of the expense, and the problem of the management was to do the largest possible amount of carrying in proportion to the cost of the rest of the equipment, or unless it were equipped as

though the rest of the equipment formed no part of the expense and the problem was to do the largest possible amount of carrying in proportion to the cost of the rolling stock, the proposition would hold good that an increase in the rolling stock would increase, but not proportionally, the carrying capacity of the road. The same may be said, under normal conditions, of an increase in any other kind of capital, or in any kind of labor, though, of course, it would be possible to name some kinds which would be of so little importance to the running of the road as to make the effect of an increase almost imperceptible.

This is sometimes called a case of increasing returns, but that is a mistake, and is based upon defective analysis. Increasing returns would exist only when an increase in the rolling stock would more than proportionally increase the carrying capacity of the road, and not when it simply increased the carrying capacity more than it increased the total cost of operation. Doubling the rolling stock would not, in any normal case, more than double the carrying capacity, though it might increase the profits by increasing the carrying capacity more than it increased the total cost, the reason being that a large part of the cost of operation would not be increased at all. It will be remembered that we found that it

always pays to cultivate a farm beyond the point where diminishing returns begin, — that is, if the land costs anything. If any expensive piece of land were being cultivated only up to the point where diminishing returns begin, an increase in the labor and capital would not proportionally increase the product, though it would increase the product more than it would increase the total cost, thereby increasing the profits of the farm. The reason is, in this as in the other case, that one element in the cost, viz., rent, would not be increased at all. What is really meant by calling this a case of increasing returns is that the road is not securing the maximum economy until it is able to combine the various factors in such proportions as will make the marginal productivity of each factor equal to its cost. This is impossible for some railroads, owing to lack of available traffic, and it is also impossible for many other industrial establishments for similar reasons.

The conclusion is, therefore, that in any industrial establishment, it is most profitable to use that amount of each factor which will make its marginal product just equal to its cost. If, by increasing any factor, there would be added to the total product of the establishment more than enough to pay the cost of increasing that factor, obviously it would pay to increase it. Or if, by decreasing such a factor, more

would be saved in its cost than would be lost in the diminution of the total product, it would pay to decrease it. The same principle helps to determine the most profitable size for the whole establishment. Even when the various factors are combined in the right proportions, it may pay the owner to enlarge or contract the whole establishment by increasing or decreasing all the factors. If, by thus enlarging the establishment, the total product can be increased more than the cost, obviously it will pay to enlarge. It is equally obvious that it will pay to contract if by so doing the product will be decreased less than the cost. Either method would increase the surplus remaining after paying the cost of the three factors named. This means that the most profitable size for the establishment is that under which the marginal product of all the factors combined will just equal their cost.

But this, it must be observed, does not necessarily give the size which will give the largest total product in proportion to the land, labor, and capital employed. The reason is that there is another factor, not usually classified under any of these heads, with which we must reckon, and to which we may give the name *management*. An industrial establishment is a combination of various factors under one management, and the question of large or small scale production

becomes, therefore, a question of the proportion between the factor called management, on the one hand, and all the other factors, on the other. Formula III, which was given as an expression for the law of increasing or decreasing economy of large-scale production, may be modified as follows, to take account of this new factor: —

	Management	Land	Labor	Capital		Product
If	M with	X with	Y with	Z will produce	. .	P,

then M with aX with aY with aZ will produce { more than aP { (Increasing economy of large-scale production.) } less than aP { (Decreasing economy of large-scale production.) }

From this it will appear that the law of the increasing or decreasing economy of large-scale production, while sufficiently distinct from that of increasing or diminishing returns to warrant a difference of name, is yet fundamentally very much like it.

The similarity is most important when we consider the difference between that size which will enable an establishment to turn out the largest product in proportion to the land, labor, and capital employed, and that which will enable it to turn out the largest surplus over and above the cost of these three factors. A small establishment, being more easily man-

aged, might be able to turn out a larger product in proportion to these elements in the cost of operation than a large one could, and yet, owing to the smallness of the total product, the surplus might not be enough to enable the manager to live. He might, for example, be able to manage a ten-acre wheat farm so well that it would produce $200 worth of wheat at a cost, in the way of rent, wages, and interest, of only $100, whereas if he ran a hundred-and-sixty-acre farm he might be able to make it produce only $3000 worth of wheat at a cost of $2000. In the former case the product would be twice the cost, and in the latter case only one-half greater; yet the latter would leave the manager $1000, while the former would leave him only $100. The latter would be, from the standpoint of the owner of the farm, a better proportion than the former between management and the other factors.

But if we could imagine managing ability being so abundant and so cheap that its cost could be eliminated, and that rent, wages, and interest constituted the whole cost, a series of ten-acre farms, sixteen in number, under separate managers, would be a better proportion than one farm of a hundred and sixty acres. Under these assumed conditions, the best proportion between the factor called manage-

ment and the others would be that which would yield the largest product in proportion to the others, just as we found, when we assumed that an indefinite amount of land of the same grade could be had free of cost, that it would pay to use as much land with a given amount of labor and capital as would yield the largest product in proportion to these factors. In other words, it would pay to stop cultivating the land at that point where increasing returns leave off and diminishing returns begin. But seeing that the factor called management is both scarce and expensive, it can not be eliminated from the cost, and it must therefore be economized just as land or any other expensive factor has to be economized. The way to economize it is to use less of it in proportion to the other factors, which means that they would not be so managed as to yield their maximum. The same rule applies here as to the other problems relating to the proportions in which to combine the various factors, viz., as many other factors should be combined with a given amount of management — such an amount, for example, as can be furnished by a given manager — as will make their marginal product equal to their cost. This means that they should be employed in larger amounts than would give them the largest productivity per unit, beyond the point, in other words, where diminishing

returns (or decreasing economy of large-scale production) begin. In this particular also, the factor called management comes under the same general law as the other factors.

The conclusions thus far reached in this chapter may be summarized as follows: in the creation of any product where there are various factors employed, usually classified as labor, land, and capital, the amount of the product does not depend wholly upon any one or any two of these groups of factors, but upon all three. Consequently, if any one or any two groups are varied in amount, the rest remaining the same, the product will vary, but not in exact proportion to the variable factors. In all normal cases, — that is, where the various factors have been combined in profitable proportions, — if some of the factors are increased, the increase in the product will not be so great as the increase in these factors. Thus, if the land remains the same while the labor and capital are increased, the product will increase, but not in proportion to the labor and capital. Or if the labor and capital remain the same while the land is increased, the increase in the product will not be so great as the increase in the land. But the factors of production can be classified into a great many smaller groups than these. There are a great many kinds of labor, of land, and of capital, each

one of which may be regarded as a separate group, and all that was said of the larger groups can also be said of these smaller ones. Though after the law of diminishing returns has begun to operate with respect to any factor an increase of that factor will not correspondingly increase the total product of the establishment, it will, however, increase the product more than it will increase the total cost — up to the point where the marginal product of that factor is just equal to its cost.

From the standpoint of the distribution of wealth, each and every phase of this universal law of diminishing returns is important, for each and every one has an important part in determining some share in distribution. But no other phase of the law is of such far-reaching importance as that which was originally developed, and to which the term was originally applied. Though it is the same law which determines the productivity of varying amounts of land when combined with a fixed amount of labor and capital, as that which determines the productivity of varying amounts of labor and capital with a fixed amount of land, or of varying amounts of labor with fixed amounts of land and capital, yet, as a matter of fact, the available amount of land in the world at large varies less than the other factors. In any civilized country the available land supply is a

relatively fixed quantity, while the labor and capital are continually varying. Moreover, these variations are the products of the human will, while the supply of land is practically beyond control.

This difference, however, is of more importance in the study of the problem of the production of wealth, in any geographical area such as any of the countries of Europe or America, or of the maintenance of the population of such countries, than in the study of distribution. From the law of diminishing returns in its original form is derived the conclusion that if, in any given state of civilization and the industrial arts, the supply of labor should increase through the growth of population, while land and capital remain the same, or if the labor supply should increase faster than that of land and capital, the average production of wealth per head would diminish. This is to say, the increase in the total production of wealth would not be so great as the increase in the supply of labor, though there would be a larger production in proportion to the land and capital. But if, with the increase in the supply of labor, there should take place an improvement in the arts of production, or an increase in the supply of capital, or the available supply of land (through improvements in transportation), a larger production of wealth per laborer would be quite possible and fully in harmony with

the law of diminishing returns. And if the supply of labor should remain the same while the land and capital increased, or if these should increase faster than labor, a larger total, and consequently a larger per capita, production would result.

That a stationary state of civilization and the industrial arts may exist along with a growing density of population is a somewhat violent assumption, since density of population is often, especially in western countries, an important factor in stimulating progress. In the first place, greater density, up to a certain point, makes possible a higher degree of industrial organization and a more minute division of labor, both of which add powerfully to the efficiency of production. In the second place, the mere proximity of persons to one another tends to stimulate mental activity and to increase inventiveness through the multiplication of suggestions. The chances are that ten men will think of more things than one man, and where they are in close touch with one another the thought of one becomes the thought of all. And in many other ways, also, does density of population promote progress.

Nevertheless, *if* civilization should remain relatively stationary while population increases in density, there would be a smaller per capita production because of the law of diminishing returns. The

terrible reality of this law is witnessed by the overcrowding of those populations where, as in the unchanging East, civilization has become stationary — enveloped in a "crust of custom" which counteracts and destroys the enlivening effects of density. It is also witnessed by the conditions which continually face uncivilized tribes whose means of livelihood are precarious and who must therefore jealously guard their hunting grounds against the incursions of outsiders. They well know that a contraction of their hunting area, or an increase in the number of hunters in the same area, means scarcer food. Many of the wars and migrations of prehistoric times have doubtless been forced by the cruel necessities of this law. Even under the conditions of modern civilization, the operation of this law can be clearly observed with respect to any particular industry. Hunting and fishing still decline speedily in productivity when the number of hunters or fishers increases in any given area of land or water. Pasturage still conforms to the same law, as it did in the days of Abraham and Lot. Agriculture becomes less remunerative under the same conditions, which alone accounts for the migration of farmers from the more densely, to the less densely, settled areas of the same general fertility. Even manufacturing becomes less productive per unit of labor and capital employed,

after the best situations have been occupied and the existing plants have reached the maximum economy of large-scale production.

But with respect to the livelihood of a complex population, considering all its industries in a mass, the operation of the law is not so clearly perceived. For a sparse population, hunting and fishing may prove the most remunerative of all industries, and yet may not furnish so good a living as some other occupation would furnish, under the same outward conditions, to a larger population. Pasturage, for example, might be out of the question because of the depredations of wild beasts which a sparse population would be unable to exterminate or hold in check. But with a population large enough to hold the noxious beasts in check, pasturage might prove more remunerative than hunting and fishing had ever been. Again, agriculture might be unremunerative for a sparse population because of the unequal contest with the forces of nature. The owner of a small field in the midst of a forest must fight continually against the efforts of the forest to reëstablish itself. This fight naturally becomes more strenuous on the border between field and forest. In the case of a small field, the ratio of the border to the whole area is large; but in the case of a large number of adjoining fields, this ratio is smaller. For this reason alone,

if for no other, the owners of a large number of adjoining fields find it easier to keep back the forest. This, combined with other reasons, may make agriculture more remunerative for a slightly more dense population than pasturage had been for a sparse population. Following out the argument, it would not be difficult to think of reasons why manufacturing might become still more remunerative for a still more dense population, though less remunerative for a sparse population. Again, the development of one industry frequently helps the others. Manufacturing, for example, makes even hunting and fishing, as well as agriculture, more productive by providing them with better implements. But this is only one phase of the advantage of a division of labor.

But it is scarcely possible to conceive of a transition from hunting and fishing to pasturage, from pasturage to agriculture, and from agriculture to manufacturing, without an increase in the supply of capital as well as of labor. The increase of capital is an additional factor of paramount importance in making the more highly developed industrial state remunerative. If capital increases faster than labor, — enough faster to offset the growing scarcity of land, — the law of diminishing returns alone would account for an increased productiveness of labor.

But if the increase of labor were not uniform, some kinds increasing more rapidly than others, the productiveness per unit of those kinds which increased more rapidly would necessarily decline relatively to that of those kinds which increased less rapidly. Other factors might enter in to make the productiveness of the former class as high as ever, speaking absolutely; but nothing could prevent its declining relatively to that of the latter class except a radical change in the system of industry, which would call for a more than proportional increase in the former class of labor. This is in accordance with our extension of the law of diminishing returns, and is that phase of the law represented by formula IX. This phase of the law has an important bearing upon the question of differences of wages in different occupations, which will be more fully discussed in the chapter on Wages.

COLLATERAL READING

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CHAPTER III

THE FORMS OF WEALTH AND INCOME

THERE are a great many things in the world about us to which we are economically indifferent, although they are absolutely necessary for our existence. We do not care to own or to possess them exclusively, for the sole reason that they are so abundant that no one needs to give himself any concern about getting them. There is enough to go around and to abundantly satisfy all who need them; consequently they have no value and are not classified as wealth. Since the supply is so great that every one has all that he wants, no one could sell any portion which he might appropriate. No one would want that particular portion when he already had enough of the same thing. Since it is not necessary to economize in their use, they are not economic goods, or wealth.

But all appropriable things which are scarce enough to leave some wants unsatisfied are, in the time and place where they are wanted, economic

goods. Men have to economize in the use of such things. Since there are not enough to go around, men must compete with one another for their possession. The civilized mode of competing for such things is to bid for them, offering other goods or services in exchange for them. Therefore they have value, and they figure on the market. Each unit of such a commodity is wanted by some one whose well-being, as he conceives it, will be improved by the possession of it. Of the former class of non-economic goods it can not be said that any individual considers that his well-being would be improved by the ownership or possession of any specific unit, though of course his well-being may depend absolutely upon the existence of such things in a general sense. As stated in a previous chapter, though men could not live at all without air, yet any particular cubic yard might easily be dispensed with. No one's well-being depends in the slightest degree upon its possession. On the other hand, men could live comfortably if there were no such thing as gold. But gold adds something to the gratification of mankind, and its supply is so limited that every individual ounce is wanted and will contribute something to some one's well-being, as he understands it.

Our first distinction, therefore, is that between

economic and non-economic goods. The former constitute wealth, and with them the economist is concerned. In fact, man's chief concern in this world is with this class of goods. He finds himself out of harmony with his environment in that he has needs which his natural environment does not supply. As with every species, his chief struggle is that for adaptation. The human struggle for adaptation takes the form of a vast, united effort to increase the supply of those things whereof nature has provided an insufficient supply. That is what industrial civilization means.

Some economic goods yield up their utilities directly to their *possessors*[1] and are called consumers' goods. They include such things as food and clothing in the hands of their consumers, dwelling houses, landscape gardens, pleasure vehicles, etc. Such things do not transmit utilities to other things; they transmit them directly to persons. They do not have to be transported or transferred in order to serve the purpose of their possessors; they are themselves enjoyed, or they give direct satisfaction to their users. Other goods yield up their utilities only indirectly to their possessors and are called producers' goods. They include tools and machines, farm lands and business sites, money, raw materials,

[1] As distinguished from their *owners*.

and merchants' stocks, even when these consist of things which are destined ultimately for consumption. All such goods have to be used in producing or imparting utilities to other goods, or to be transformed or exchanged, in order to answer the purposes of their possessors. They are not themselves enjoyed; they give satisfaction only indirectly through the medium of other goods which they enable their possessors to secure either through production or exchange.

All the material wealth of the community may be divided into these two classes, — consumers' goods, yielding utilities directly to their possessors, and producers' goods, yielding utilities indirectly to their possessors. The fact that some things may be partly consumers' and partly producers' goods, or consumers' goods at one time and producers' goods at another, — like the musician's instrument, which is used both to beguile his time and to earn his living, — does not destroy the validity of this classification. The distinction is quite as clear as that between plants and animals, or as that between houses and barns, or men and boys. No one would deny the validity of the distinction between houses and barns simply because some buildings were difficult to classify.

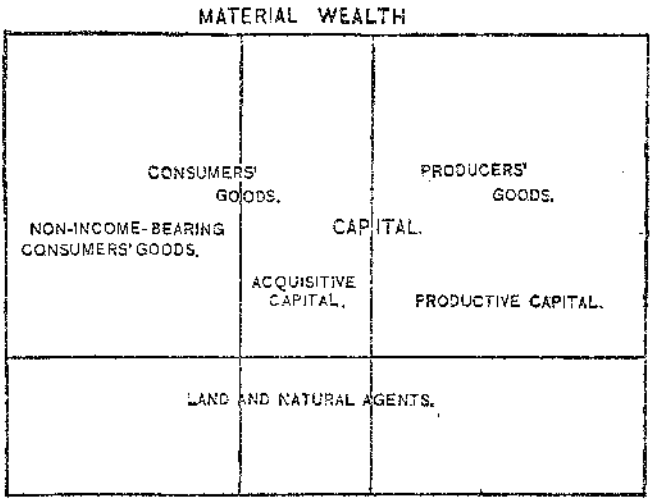
Some goods yield up their utilities directly, and

others only indirectly, to their *owners*.[1] The former include such consumers' goods as are used by their owners for their own direct satisfaction, and are not loaned, rented, or hired. The latter include all producers' goods and such consumers' goods as are not used by their owners, but are loaned, rented, or hired. All goods of this latter class, whether they be producers' or consumers' goods, hold the same relation to their owners that producers' goods do to their possessors. Their owner prizes them not for their own sakes, but for the sake of the other goods, or the income, which they enable him to secure. To this class of goods the name capital is generally applied by the world at large, though economists have, for special reasons which will be given later, excluded land and natural agents.

That part of capital which consists of producers' goods is sometimes called productive, and sometimes social, capital; while that part which consists of consumers' goods is sometimes called acquisitive, as distinguished from productive, and sometimes private, as distinguished from social, capital.

The following figure, in which capital is shown to include producers' goods and all income-bearing consumers' goods, will serve to illustrate the chief subdivisions of material wealth: —

[1] As distinguished from their *possessors*.



The reasons usually given for separating land from other goods and treating it in a class by itself are: first, that land is a free gift of nature, whereas other goods are produced by human effort; second, that land can not be reproduced or increased in supply, and there is no limit therefore to its increase in value, whereas other goods can not rise to a value much above that which will tempt men to undertake their production, that is, their value can not rise, for any long time, much above what it costs to produce them; third, land does not go out of existence, whereas other goods are continually wearing out and having to be replaced by new ones. All these distinctions

are valid and important, when properly understood, but they are capable of being misunderstood and also of being greatly exaggerated.

To the first distinction it may be objected that other goods are, in their original form, free gifts of nature as truly as land. The only basis of a man's claim to them is that he appropriated them and changed their form to suit his own or some one else's purpose, — that is, he put them into a form which was valuable. The same is true of land, and it is this aspect of the case which would naturally appeal, and did as a matter of fact appeal, to the first settlers in a new community. If one settler saw a tree which seemed to contain possibilities, and chopped it down and made it into a table, it would be in accordance with social utility that the table should be his. If another settler saw a piece of land which seemed to contain possibilities, and cleared it and ploughed it and reduced it to cultivation, on the same reasoning the land would be his. Each settler would have found a free gift of nature, each would have worked upon it, each would have changed its form from the raw state in which he found it to a form which would serve his purpose. The mere fact that the result of one's labor happened to be a farm, and that of the other's labor a table, would not have appeared at the time to be a real difference. This aspect of the case is

recommended to the consideration of those who believe that the private ownership of land is forbidden by a moral law ordained from the foundation of the world.

If, however, the community should grow in population, a real difference between the table and the land would begin to appear. In the first place, it would be found that the owners of the land held control of the original raw material for the manufacture of tables and all other produced goods. When the maker of the first table wished to make a new one to replace the old one when it was worn out, he would have to pay the landowner for the privilege of cutting a tree from which to make it. In the second place, the value of the land would increase in proportion to the number of persons wishing to make use of its products either for purposes of consumption or for the purpose of producing other goods. The fortunate owners of the limited supply of land would find themselves in possession of a growing income far in excess of anything which the land may have cost them, whereas the owners of the tables and other such goods would find themselves always compelled to expend approximately as much in the making of them as they were worth. As time goes on this difference increases, especially in a growing city, until small areas of land come to have fabulous

prices, while the value of tables continues to bear a fairly close relation to their cost of production.

To the second distinction it may be objected that land is sometimes "made" in the sense of being reclaimed from the sea or the desert, whereas there are other goods, such as antique furniture and rare works of art, which can not now be reproduced. But the fact remains that by far the greater part of the present land supply is not "made." In fact, there is not enough "made" to have any appreciable effect on the value of land in general, and it certainly does not prevent certain choice situations from rising to stupendous prices. On the other hand, with few exceptions, other goods are capable of reproduction, and are actually reproduced so long as they have a value high enough to repay the cost of production. Whereas non-reproducible land is the rule and reproducible land the exception, reproducible goods of other kinds than land are the rule and non-reproducible ones the exception. This may be called a difference of degree only, but the difference of degree is so great as to constitute, for scientific and practical purposes, a difference of kind. As a matter of fact, nearly all scientific differences are differences of degree. It is not denied, however, that there are many resemblances between land and other goods. There are also certain resemblances

between a man and a clothes-pin, but the differences are sufficiently important to warrant our placing them in different classes.

Again, it may be urged, the process of producing some other goods is so slow as to give the owners of the existing supply, in a time of rising demand, all the advantages which come from the ownership of land. That is, the work of increasing the supply to meet the new demand is so slow that the existing supply may, for a considerable time, command a price far above its cost of production. But the same reply can be made to this objection as to the last. It compares a temporary and exceptional characteristic of these other goods with a normal and permanent characteristic of land.

To the third distinction a somewhat stronger objection can be urged. Though land itself, considered as a whole, is indestructible, certain properties of the land, which are sometimes important elements in its value, are destructible. The chemical and physical properties which give fertility to the soil are constantly being worn out and replaced. Their preservation requires as much intelligence and foresight, and as much sacrifice, as the preservation of the stock of any other kind of goods. This has led some writers to exclude the soil from the definition of land, narrowing it down to merely space, location,

and support, — the properties which give it value in cities, which properties are also indestructible and non-reproducible. But this seems like an unreal and unnecessary refinement. Besides, it is not essential that land should be absolutely unlike other goods in every particular in order to justify its being placed in a class by itself. The fact that space, location, and support, — properties of land which can not be produced nor destroyed by individual effort, — are important factors in its value, is sufficient to distinguish it from other goods, even though it possesses some properties in common with them. However, it must be admitted that where the fertility of the soil is the principal factor in the value of land, and the indestructible properties of minor importance, there is less reason for the distinction than exists when these properties grow to paramount importance and the fertility of the soil becomes a minor factor. Thus, in a new and sparsely settled community where the land is used mainly for agriculture, and where space has not yet become appreciably scarce, land differs less from other goods than it does in an old and densely populated community, especially in a large city, where space and location are everything, and the fertility of the soil counts for little or nothing.

Another curious objection, which applies to all

three distinctions alike, is that while land surface is a free gift of nature, land *capital* is not, but is produced and destroyed precisely as other forms of capital are; that those who speak of land as though it were mere land surface are guilty of identifying a geographical with an economic conception; that economic land, or land capital, has to be fashioned out of land surface just as other forms of capital are fashioned out of materials which nature affords; and that though the land surface of the globe may not be materially increased, land capital may be indefinitely increased[1]. Now land capital can not possibly mean anything else than land *value*, since it is used in a way which excludes improvements placed on the land such as buildings and fences. But to argue that though land surface may not be increased, land value may, is to beg the whole question. One might as well say that during the supposed coal famine of the winter of 1902–1903, it was not coal in the economic sense, but only in

[1] Cf. the paper by Professor Carl C. Plehn, read before the Massachusetts Single Tax League, December 8, 1902. The same reasoning seems to underlie the objections of Professors J. B. Clark ("The Distribution of Wealth," N.Y., 1900) and Frank A. Fetter ("The Relations between Rent and Interest," Publications of the American Economic Association, 3d Series, Vol. V, No. I, Part I), since both identify land with the other agents of production, and use the term "capital" to signify the value contained in all such goods.

the material sense, which was scarce; that though there were few coal-tons there was much coal-value; and that therefore there was as much coal, in the economic sense, as ever: but that would be a travesty on the science of economics.

An objection, hardly less curious, is that under static conditions the supply of other forms of capital is as fixed as that of land. At any given instant, when the conditions of supply and demand are in a state of equilibrium, it is as impossible to increase the supply of other goods as it is to increase the supply of land.[1] This implies an admission that if time were given the supply of other things is more variable than that of land; but, it is claimed, that would destroy the assumed static conditions. All this may be quite true; but, aside from the doubtful utility of so heroic an assumption as that of a static state, there is the undoubted fact that if land, in such a static state, has any value at all, that assumed static state must have been preceded by a dynamic state in which the value of the land rose from nothing — being a free gift of nature — to its present level, through its growing scarcity and not through the labor of its owners. Even in the static state, therefore, land differs from other goods in that its value bears very little if any relation to its cost of produc-

[1] Cf. J. B. Clark, "The Distribution of Wealth," p. 338.

tion, being due to sheer scarcity which human labor could not materially alleviate.

There are, however, certain ways by which the scarcity of land is alleviated when the pressure becomes great enough to furnish the inducement. In the first place, though more land can not be brought into the community, a part of the population can move out into the frontiers of civilization, thus enabling a given number of people to make use of more land. In the second place, improved transportation facilities may enable a given community to draw its subsistence from a larger area. In the third place, a more intensive use of the land may enable a given number of people to get along with less land than would otherwise be necessary. But none of these methods, nor all combined, have been able to alleviate the scarcity sufficiently to prevent land from rising to enormous values in thickly populated centres.

Another distinction, or supposed distinction, between land and other forms of productive wealth or capital is based upon a supposed difference in the laws which determine the incomes from the two sources. It is held, for example, that the income from capital is, or tends to be, a uniform rate in the same market, whereas there is no uniform rate of rental for land. The interest on a given amount of

capital is a uniform percentage of its principal, whereas the rent of a given piece of land is determined by the difference between that which it will produce and that which the same amount of labor and capital can produce on the poorest land in cultivation, which may, it is assumed, be had for nothing. While all this is true enough, it does not constitute a real difference because the comparison is not valid. The same basis of measurement is not adhered to in both cases, land being measured on the basis of superficial area and its quantity expressed in acres, whereas capital is measured on the basis of value and its quantity expressed in terms of dollars. Measured on the basis of value and expressed in terms of dollars, land earns a uniform percentage of itself as truly as does capital. Measured on any other basis, or considered as individual pieces of matter, neither land nor capital earns a percentage of itself. Where a dollar's worth of capital earns five per cent, a dollar's worth of land will also earn five per cent.

Whenever a person has in mind the income from a definite piece of property, whether it be land or not, he usually speaks of it as rent; but when he thinks of the same income as derived from a quantity of wealth, measured on the basis of value, he invariably speaks of it as interest, though he will sometimes

distinguish between gross and net interest, gross interest being the whole income and net interest being what is left after allowing for insurance, repairs, and deterioration.

Though it is true that one acre does not necessarily earn as much as another, neither is it true that one plough, or one horse, or one loom, earns as much as another. Moreover, there are certain forms of no-rent capital as well as no-rent land; there are machines and tools on the way to the scrap heap, buildings that are barely worth preserving, and other forms of capital so poor that they can be had for nothing, or at most for what they are worth as old iron or lumber. The most that any one would be willing to pay for a superior machine would be the difference between what he could produce with it and the amount which he could produce, by the same expenditure of labor and other capital, with one of those machines which he could have for the asking. At least, this is as true of machines as it is of land.

In order to measure anything it is necessary to abstract some one of its properties, such as length, or bulk, or weight, or some form of energy, and compare it with other things on the basis of that property. Thus in measuring a string we simply compare its length with that of something else, and in meas-

uring pig iron we compare its weight with that of something else. In order to express the quantity in either case we must state the ratio which this property of the thing in question bears to the same property in some other thing which has been agreed upon as a standard. Our idea of the quantity of a thing will depend largely upon the property which is selected as a basis of measurement or comparison. If, for example, we take a piece of cork weighing one pound, and a piece of lead weighing two pounds, and if we choose to measure and express quantity in terms of weight, there would be twice as much lead as cork. But if we were to decide to measure and express the quantities of the same pieces in terms of cubic contents, we should have several times as much cork as lead. Wealth has come to be measured on the basis of that property called value.[1]

When wealth consisted mainly of flocks and herds, it was customary for the primitive herdsman to reckon the quantity of his wealth numerically as so

[1] The importance of this conception of an economic quantity can hardly be overestimated. It not only helps to clear up the confusion regarding the nature of capital, but it is essential to the solution of a number of other knotty problems in economic analysis. When it is once understood, for example, that a quantity of money is a quantity of value, it will become apparent at once that very little that has been written on the quantity theory of money has hit the point.

many *head*, from which, according to some authorities, we get our words cattle and capital. But as the forms of wealth increased it was no longer possible to express their quantity in terms of mere number, unless they could all be reduced to a common denominator. This was done by reducing other forms of wealth to cattle by saying that the various articles were worth so many head of cattle, or that they were equal in value to so many cattle. This was a method of measurement and of quantitative expression quite as exact and definite, so far as the logic of the process was concerned, as to say that a certain lump of matter weighs ten pounds, which simply means that it possesses ten times as much weight as a certain other lump of matter which has been arbitrarily chosen as a standard of weight. The only essential difference is that in one case value, and in the other, weight, is chosen as the property upon which to compare the things to be measured. Value is the basis which is still used for the measurement of wealth, though the unit of measurement has changed many times, being now, in this country, a piece of gold nine-tenths fine and weighing twenty-five and eight-tenths grains.

The fact that capital is habitually measured on the basis of value, and its quantity expressed in terms of some unit of value, such as a dollar, has

led certain writers into thinking that capital *is* value,[1] which is quite as great a mistake as to assume that coal is weight, or that lumber is bulk. However difficult it might be for the average business man to formulate a definition of his concepts, yet he shows, under the proper tests, a perfectly clear idea of the relation between the things called capital and their quantitative expression. When asked *how much* capital he has, he will answer: so many dollars, or so many dollars' worth. This is clearly his method of expressing quantity — of answering the question: how much? But if asked *in what his capital consists*, he will enumerate the concrete things in his possession, — the buildings, machines, and materials of various kinds, including the cash on hand, thus showing clearly that he cherishes no illusions as to the real nature of capital.[2]

We are warranted, therefore, in adhering to the conception of capital as concrete, material articles,

[1] Cf. Clark, "The Distribution of Wealth," Chapter IX, also Fetter, "Recent Discussions of the Capital Concept," *Quarterly Journal of Economics*, November, 1900.

[2] Professor Charles A. Tuttle (*Quarterly Journal of Economics* for November, 1903) objects that an inventory is the only real quantitative expression for a body of wealth. On the contrary, there are various ways of expressing quantity, of which the inventory is the crudest. One might as well say that the only way of expressing the quantity of a pile of lumber is by writing an inventory of the pieces contained in it.

produced by human effort, and used by their owners for the purpose of securing an income. Such articles are continually being produced, worn out and reproduced more or less rapidly, which means that capital itself, which is merely a group name for such things, is also undergoing these processes.[1] Its quantity, however, is habitually expressed in terms of value; but in this it does not differ absolutely either from land or from non-income-bearing consumers' goods, since all forms of wealth may be measured and quantitatively expressed in the same way. The fact that the quantity of land may be expressed in dollars does not identify land with capital any more than the fact that all forms of consumers' wealth may be similarly measured identifies them also with capital. Nevertheless, it is sometimes more convenient, when speaking of the amount of capital in one's business, to include land rather than to make a separate statement of its value. But this does not obscure the real differences, already pointed out, between land and produced goods. Moreover, land is more often measured in acres than in dollars, and the income from it is more often conceived as rent than as interest, whereas other

[1] Professor Clark (*op. cit.*), who distinguishes between capital and capital goods, holds that capital is indestructible, though capital goods perish.

goods, for lack of a common physical basis of measurement, are more frequently measured in dollars than in any other way, and the income from them is consequently more often conceived as interest than as rent. But popular usage does not adhere strictly to any one meaning, for either rent or interest, as we shall see later.

Goods of different kinds differ greatly in the length of time it takes them to yield up their utilities, whether directly or indirectly, to their possessors. Some yield them up quickly, almost instantaneously, while others yield them up slowly, furnishing a flow of utilities over a considerable period of time. A piece of confectionery, for example, or a bunch of firecrackers, yields up all its gratification in a few blissful seconds, whereas a well-built house furnishes a continuous flow for a century or more, and a piece of land for an indefinite period. Between these extremes there is every conceivable variation. In the case of goods which last long enough to make it worth while to do so, the world has learned to evaluate the flow of utilities which come from them during a given time, in addition to evaluating the goods themselves. The house, for example, or the land, will not only sell outright, but it will rent,—that is, the utilities which it will furnish during a given time will also sell for a price. The same is true of anything

else whose consumer or user can not extract all its utilities in a short time. This includes all land and a number of other durable goods.

In popular usage, the word "rent" is commonly restricted to the price which the owner receives for the use of a thing of this class when it is loaned, rented, or hired to another. But a term is also needed for the income which the owner receives when he himself makes use of the article instead of letting it out to another. The word "income" is restricted to money or other material goods, and does not include the flow of utilities which come directly from the use of such an article. Thus the dwelling house in which the owner himself lives does not furnish him an income, but the one which he rents to another man does. Though each house furnishes him a flow of utilities, one furnishes them directly, whereas the other furnishes them indirectly in the form of other goods. But a piece of durable producers' goods also, such as a plough or a loom, furnishes an income rather than a flow of direct utilities, even when used by the owner himself. If the term "rent" is to cover the income which such an article furnishes to its owner when it is loaned, rented, or hired, the same term might as well be used to cover the income derived from its use by the owner himself, since there is no essential economic difference

between them. However, the term "rent" is almost never used in this extended sense.

For a large proportion of income-bearing goods it is not possible to separately evaluate their flow of utilities. The coal which is consumed under a boiler can not be rented, because its flow of utilities is so speedily exhausted that it would be impracticable to evaluate them for any given period. The same is true of the money in the business man's cash drawer. Though it is as necessary as the coal to the running of his business, and is a means of securing an income, yet it serves his purpose once and for all, and then only when he is in the act of parting with it. But a certain *quantity* of coal or money may be loaned, rented, or hired on the understanding, not that the same coal or money, but that the same *quantity* of coal or money, should be returned with something additional to pay for the loan. This additional sum is never spoken of as rent, but usually as interest. When that which is paid for the loan and that which is loaned are both reduced to the same quantitative expression, both being measured in terms of value, one is a ratio or a percentage of the other. It has therefore become customary to contract for a certain rate or percentage of payment instead of a definite number of dollars.

All that was said of coal and money can be re-

peated of merchants, stocks, and of raw materials and finished goods in the hands of manufacturers. Some of these goods may, when completed and serving their ultimate purpose in the hands of their final users, furnish a sufficiently prolonged flow of utilities to enable them to be rented. But in their present stage, their income-bearing capacity is of a different kind. Each individual article serves its present owner's purpose once for all, and by one act, as it were, adds a definite sum to his income. But certain *quantities* of such articles may be loaned, rented, or hired, as in the case of coal or money. The income from the loan of all such goods is never called rent, but is always called interest. But if the word "interest" is to cover the income from the loan of such things, the same term might as well be applied also to the income which the owner derives from them when he uses them himself in his own business, since there is no essential economic difference between them.

We have, therefore, a possible division of income-bearing goods into two classes[1]: first, durable goods which furnish their present possessors a flow of utili-

[1] This is essentially the old distinction between fixed and circulating capital, except that land is, for the present, not excluded, and that the basis of the distinction is not the same. It is also practically the same as the lawyer's distinction between fungible and non-fungible goods.

ties over a considerable time. This class includes such things as land, buildings, machinery, draft animals, and vehicles, all of which, when serving their ultimate purpose, *may* be rented as individual articles, because their utilities during a given time can be evaluated as well as the things themselves. Second, perishable goods, and those also which serve the purposes of their present possessors by a single act, or in a brief period of time. This class includes such things as food, fuel, horse-feed, stock in trade, and money, none of which can be rented as individual articles, but can be hired by the *quantity*. When they are so hired, the sum which is paid for their use is never called rent, but usually interest, at least where it has become customary to measure wealth in terms of some unit of value, such as a dollar. Following out this classification, we might divide the incomes of the owners of all such goods into two classes, called rent and interest, rent being that derived from the ownership of goods of the first class and interest that derived from the ownership of those of the second class. At least there is a certain popular sanction for such a classification. Nevertheless the income from the first class of goods is sometimes called interest also, when they are reduced to terms of value, but that derived from the second class is never called rent. It is therefore a mistake

to make the unqualified statement, as certain writers have done,[1] that rent and interest are only different names for the same income viewed from different standpoints. Such a statement could be true only of incomes from the first class of goods.

But this classification is unsatisfactory for two reasons. In the first place, business practice does not generally distinguish between goods of the second class and that portion of the first class which excludes land and natural agents. The merchant regards his shelves, counters, desks, and cash carriers as parts of the fund or quantity of capital with which he does business, just as he does the goods on his shelves or the cash in his drawer. If he owns the buildings, they also figure in the same account. The manufacturer does not distinguish his engines from the coal which they consume, nor his machines from the materials which pass through them. Nor does the farmer distinguish his machinery from his seed, nor his horses from his horse-feed. All these things are habitually classed together as parts of the fund or quantity of capital in the various lines of business.

Even the land is sometimes so treated, but not so

[1] Cf. Clark, "Distribution of Wealth," pp. 123–125, and 335–337. Also, Fetter, "The Relation between Rent and Interest," Publications of the American Economic Association, 3d Series, Vol. V, No. I, Part I, pp. 182, 186, 194, 196, and 197.

uniformly. The merchant and manufacturer frequently regard their land as merely so much capital, thinking of it in terms of dollars rather than acres; but this is seldom done by the farmer, who outnumbers them all. In agriculture, where most of the land is utilized, it is uniformly looked upon as a distinct factor in production, — the basic factor upon which labor and capital are expended, — though certain classes of improvements are not always distinguished from the land. Agricultural land is commonly thought of in terms of acres rather than in terms of dollars. Practical life, therefore, furnishes a kind of sanction for including all income-bearing goods — exclusive of land — under the one class called capital, whether they be rentable or non-rentable. There is also, it must be admitted, a certain amount of usage in favor of including land also, but the sanction for this is by no means so strong. However, popular usage is altogether too indefinite and inexact to serve as a basis for scientific nomenclature. But since it is desirable to keep as near to popular usage as is consistent with accuracy, it is enough to point out that popular usage is more favorable to the distinction between land and other income-bearing goods, including all the latter under capital, than to any other distinction.

In the second place, there is no important economic

difference between these two classes of produced goods, nor between the incomes derived from them; whereas there is a most important economic difference between all such goods and land. The fact that they are all products of human effort constitutes a likeness which is, from the economic point of view, of vastly more importance than any unlikeness in the method of computing incomes. And the fact that land is not so produced constitutes an unlikeness which is more important than any likeness in the method of computing incomes. The fact that they are perishable and reproducible, while land is not, is also an important distinction, since this limits their value to something approximating their cost of reproduction, whereas there is no such limit to the value of land. These distinctions are important because important conclusions as to public policy depend upon them, and economics can justify its existence only by throwing light upon questions of public policy. A tax on land, to take a single example, has a different effect from a tax on an article which is being produced, worn out, and reproduced by human effort. A tax on the latter class of articles has the effect of discouraging that effort and, consequently, of reducing the supply, whereas a tax on land does not affect the supply in the same way nor to the same degree.

It seems therefore that the reasons are stronger

in favor of than against distinguishing land from other income-bearing goods, and including the others under the general name of capital. This may not be satisfactory to those who require absolute differences between things placed in different classes, and absolute likenesses among those included in the same class; but economics is not the field for the exercise of such minds, for there are no such absolute differences and likenesses among the things with which this science deals. We shall adhere to the above distinctions in this book, and shall discuss the income from land under the name of rent, and the income from capital under the name of interest. In doing this we shall assume that the quantity and the supply of capital are measured in terms of value and expressed in dollars. Moreover, the quantity of capital in a community is the amount, expressed in dollars, in existence at any one time, and not the amount which comes into being during a period of time, just as the amount of a business man's capital is the amount of goods, expressed in dollars, which he has in his business at a given instant of time, and not the amount which passes through his hands during a given period.[1] In

[1] This is in harmony with the conception of capital given us by Professor Irving Fisher,—viz., as a stock of wealth existing at an in-

this last particular we shall be strictly following the usage of the business world, but we shall do this with our eyes open, knowing that capital is not value but concrete goods, and that the quantitative expression for the thing is not the thing itself.

If there is confusion and uncertainty as to the exact meaning of rent and interest in popular usage, there is double confusion and uncertainty as to the meaning of wages and profits. The word "wages" is frequently restricted to that which is paid to laborers who contract to work by the piece, or by the day, week, or month, the word "salary" being applied to that which is paid to those who contract to work by the year. But inasmuch as there is no important economic difference between the earnings of one kind of labor and those of another, a term is needed which will cover the earnings of all labor however they are contracted for or secured. Economic writers have therefore uniformly used the term "wages" in this broader sense, including even the earnings of the man who works for himself and whose wages come to him in the form of the price of a product.

stant of time as distinguished from income, which is a flow through a period of time, — except that he includes all wealth instead of limiting capital to income-bearing goods. Cf. "The Rôle of Capital in Economic Theory," *Economic Journal*, December, 1897.

The word "profits" has the most indefinite meaning of all. It is frequently used to cover the difference between the cash income and the cash outlay of a business. But this makes no allowance for the earnings of the business man's own land or capital. If he has no rent or interest to pay, the surplus of receipts over payments will of course be greater than it would be if he were doing business on rented land or borrowed capital. But instead of calling this all profits, it is better to separate it into two or more parts, since there are important differences. That part of the surplus which results from the ownership of land ought to be called rent, since it does not differ materially from that which is received from renting land to another. Similarly, and for the same reason, that part which is due to the ownership of his own capital ought to be called interest, and that which is due to the fact that he does part of the work himself instead of hiring all of it ought to be called wages. By this process we have eliminated three important items from the popular conception of profits. What does this leave?

There are, at least, two sources of income which can not fairly be classified under any of these three heads: first, the surplus gains of monopoly; and second, the superior gains of hazardous enter-

prises. These will be discussed under the head of profits, though the term "monopoly" will always be prefixed to the former class.

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CHAPTER IV

WAGES

"LABOR, like all things which are purchased and sold, and which may be increased or diminished in quantity, has its natural and its market price." Thus Ricardo long ago pointed out that wages came under the general law of value and price. We have already seen[1] that the value of any article depends upon how much it is wanted in comparison with other things, and we shall find that wages, or the value of labor, are no exception to this rule. But it is doubly important that we should here observe the caution against trying to explain the value of labor in general before explaining the value of particular units of labor. Besides, there are almost as many kinds of labor as of products, and it would be quite as unreasonable to try to find a general rate of wages for labor as to find a general price for products. Labor in general is not bought, but individual laborers are hired to do definite amounts of work, to perform specific tasks, or to render specific

[1] Chapter I.

services. We have first to explain the value of those specific services before we can arrive at any conclusion as to the wages of labor in general. The question to be determined in each case is: How much are those specific services wanted in comparison with other things? Upon the answer to this question depends the amount of those other things which the laborer will be able to get for his work.

Let us consider first the example of the laborer who, with practically no coöperation from others, produces a consumable article for sale. In such a case the amount of labor necessary to make the article is wanted just as much as, and no more than, the article which it makes. Moreover, the whole market value of the article goes to the laborer who makes it. Therefore it is safe to say that whatever determines the value of the article determines also the value, or the wages, of the labor.

Let us suppose that the laborer is gathering firewood in a primeval forest where it is worth nothing, and carrying it to a city where it is worth something. It is obvious that the labor of gathering and marketing each load will be worth precisely as much as the load itself, and that the laborer's earnings during a given time will depend partly upon the number of loads he markets, and partly upon the value of each load. This is equivalent to saying that his earnings

depend upon the total value which he produces, or that he gets just what his labor is worth to the community. If, for any reason, a load of fire-wood is not worth much to the community, obviously the labor which brings it to market is not worth much, and *vice versa.* If under these conditions the laborer is poorly paid, he can not complain of the injustice of society. If he wants higher wages than his labor is worth, he must appeal to charity rather than to justice.

In any community where there is a diversity of wants and occupations, some men being engaged in supplying one article and some another, it may happen that the producers will be very unevenly distributed among the various lines of production. That is to say, there may be a great many at work supplying one article and very few supplying another, even though the community wants as much of one as of the other. This unevenness may be due either to natural or to artificial causes. By natural causes are meant, principally, differences in natural or inherited abilities. The supplying of one article may require only such ability as the majority of men possess, while the supplying of the other may require a special kind of ability such as only a few possess or can acquire. By artificial causes are meant hindrances set up by men themselves,

such as patents, monopolies, trade-union restrictions, or any other regulation or restriction of human devising, whether legal or illegal, by means of which men are prevented from engaging freely in the production of any article.

Whether the unevenness be due to natural or to artificial causes, the result will be the same. Those who are engaged in producing the article whose supply is made abundant by the large number of producers will be poorly paid for their work, while those who are producing the article whose supply is made scarce by the scarcity of producers will be relatively well paid for their work. That is to say, this unevenness in the distribution of workers among different occupations will produce an unevenness in their rewards. Let us suppose that in addition to the laborers who are gathering fire-wood there is another group gathering nuts for the community. And let us assume, in the first place, that one kind of work is no harder and requires no more skill than the other, and that laborers can turn at will from one to the other. There could be no material difference of earnings in the two occupations, because if they were larger in one than in the other, the workers would go into the one where they could earn most. That amount of nuts which one laborer could gather in a day would sell for the same as that

amount of wood which one could gather in the same time.

But if, for any reason, the work of gathering nuts were open only to a few, whereas the work of gathering fire-wood could be carried on by anybody, the earnings of nut gatherers would be increased and those of wood gatherers diminished. There are several reasons for this result. In the first place, the reduction in the number of nut gatherers would produce, other things equal, a corresponding increase in the number of wood gatherers. That is to say, with the same population, if fewer can engage in one occupation, more must find work in other occupations. In the second place, there being fewer nut gatherers, it would not be necessary for them to wander so far into the woods in search of nuts, nor to search in such unlikely places, nor to climb such difficult trees. They could confine their efforts to the more promising fields, where nuts were more abundant and easier to find. Under these conditions each man could gather more nuts than when there were more men in the field. On the other hand, there being more gatherers of fire-wood, they would have to wander farther into the forest, and gather their wood in more difficult places. Consequently, each man could, on the average, gather less wood than when there were fewer in the field.

This is merely a case of diminishing returns. Though a smaller number of nut gatherers would be able to gather more per man, they would not be able to gather so many in the aggregate as a larger number, because, in order to do so, they would have to wander just as far into the forest, and to search in just as unlikely places. This a smaller number could not do so well as a larger number. On the other hand, a larger number of wood gatherers could gather more wood than a smaller number, though not so much per man. That is to say, the product in neither case would remain constant, nor would it vary in proportion to the number of laborers.[1]

But the reduction in the number of nut gatherers would not only enable each man to gather more, but would, through the reduction in the total supply on the market, make each bushel worth more. Similarly, the increase in the number of wood gatherers would not only make it impossible for each man to gather so much, but each cord would be worth less because of the increased supply on the market. This is an additional reason why a restriction of the number of nut gatherers would increase their earnings and diminish those of the wood gatherers.

A third reason is found in the fact that, without regard to any change in the amount of wood a man

[1] See Chapter II.

could gather, the mere increase in the value of nuts would reduce the value, or the power in exchange, of a given amount of wood. That is to say, it would, other things equal, reduce somewhat the number of other things — nuts being counted among them — for which a given amount of wood could be exchanged.[1] On the other hand, the mere fact that wood had grown cheaper would increase the value of nuts, without regard to any change in the conditions of their production or their total supply on the market. That is to say, the mere fact that one other commodity, such as wood, had grown more abundant and cheaper, would, other things equal, increase somewhat the number of other things — wood being among them — for which a given quantity of nuts could be exchanged. This leads to the important conclusion that, without regard to the conditions within his own occupation, a worker is benefited by an increase in the number in other useful lines of work, and injured by a reduction in their number. But this will be more fully discussed later.

If the scarcity of nut gatherers were due to the scarcity of the peculiar knack or skill required for that kind of work, the gatherers of fire-wood could not complain of *social* injustice as the cause of the unequal distribution of wealth. They would not be

[1] See Chapter I, p. 22.

so well paid as the nut gatherers, because their work would not be worth so much. A day's gathering of nuts would satisfy greater wants than a day's gathering of fire-wood, and society can not be blamed for paying for various services in proportion as they are wanted. That is the law of value, whether applied to services or commodities. If one gatherer of fire-wood could, in a given time, gather more wood than another, no one would deny that his services were greater. He would satisfy *more* wants. But if a nut gatherer can gather in a day such a quantity of nuts as would satisfy a *greater* want than would be satisfied by the amount of wood which a wood gatherer could gather in the same time, on the same reasoning his service is greater.

But if the high wages of nut gatherers and the low wages of wood carriers were due, not to natural causes, but to artificial regulations or restrictions whereby men were prevented from entering the better paying occupation, the wood carriers would then have a right to complain of social injustice, not, however, on the ground that wood was too cheap, but on the ground that they were prevented from gathering nuts which were worth more and would pay them better. They could not demand that society should pay more for its wood, or for the labor of supplying the wood, but that the restrictions be

removed so that they might go into the occupation where they could earn more. The consuming public would also have a right to complain of these restrictions on the ground that it was prevented from receiving a more valuable service from some of these men, and was compelled, instead, to accept a less valuable service. For if a day's gathering of nuts would satisfy greater wants than a day's gathering of firewood, it would be to the advantage of the consuming public to have some of the wood gatherers stop that work and turn to gathering nuts.

There are, as a matter of fact, very few industries where a single laborer produces a finished article of consumption without coöperation from others. Even the mechanic who works independently must usually buy his raw material and his tools from some one else. His work consists in taking a piece of material which is worth little and putting it into a shape in which it is worth more. The amount of value which he adds to it is the amount which he, together with his tools, earns. Subtract from this amount the cost of keeping himself supplied with tools, and you have the wages of his labor. Of the total value of the finished product, therefore, a part goes to the mechanic himself, a part to the maker, or makers, of his tools, and a part to the producer, or producers, of his raw materials. This gives rise to two problems in distribution:

first, What determines the total earnings of the group as a whole, including all who have a hand in the finished article? and second, How are the total earnings of this group divided among its various members?

The first problem differs in no wise from that of determining the earnings of a single worker who, without coöperation, produces an article ready for use. As he earns the value of the finished article which he produces, so a group of men who jointly produce such an article earn jointly its value, and the earnings of the whole group, during a given time, depend partly upon the number of articles which it produces, and partly upon the value of each article. Moreover, these group earnings would be increased and diminished in every respect as the earnings of the single worker. In short, all that was said of nuts and fire-wood and their producers could be said of shoes and hats and their producers, or of any other specific product of human industry and its producers, including among its producers all who contribute anything toward its production in the way of labor, materials, machinery, buildings, or land.

How the total value of the product is distributed among the various members of the group which produces it is a more difficult problem. It may be simplified somewhat by considering first the case of an article which passes through several stages of pro-

duction and comes upon the market several times before its final completion. Such an article is a loaf of bread, the material of which had figured on the market as wheat, and again as flour, before reappearing in the form of bread. To make the case as simple as possible, let us assume that the wheat is grown by an independent farmer who tills his own land with his own tools, that it is made into flour by an old-fashioned miller who runs his own mill on his own site, while the bread is made by a baker who does his own work in his own shop. Leaving out of account the possible services of tradesmen and transportation agencies who may have facilitated the exchange of materials, as well as the makers of the tools used by these three men, it becomes evident that the value of the bread represents the total value of the work done by all three, or that the value of the bread is the gross amount to be divided among them. But the share of each is determined on the open market and shows itself in the price of wheat, of flour, or of bread, — the price of the wheat being the share of the farmer, the difference between the price of the flour and that of the wheat being the share of the miller, and that of the baker being the difference between the price of the bread and that of the flour.[1]

[1] This, of course, ignores the other products of the mill and the other ingredients of the bread.

An increase or decrease in the demand for bread, when due to changes in the numbers or habits of consumers, would, in the absence of changes affecting its production, increase or decrease the demand for the labor of all three men, though it would doubtless affect the baker first and the farmer last. But an increase or decrease in the supply of bread, in the absence of changes in the numbers or habits of the consumers, would affect the different producers differently according to the location of the cause of the change. If there should be an increase in the number of wheat growers resulting in an increase in the supply of wheat which would have to be consumed as bread, let us assume, if consumed at all, it would reduce the price of bread in order that consumers might be induced to consume more. This would of course give a smaller remuneration to each farmer. But in order that the increased supply of wheat might be ground and baked, more than the ordinary amount of work would have to be done by the millers and the bakers. This would therefore increase the demand for their labor and tend to increase their wages, assuming that their numbers remain unchanged. They would not lose, therefore, but gain by the fall in the price of bread when it came about in this way. The farmers, on the other hand, would lose more than in proportion to the fall

in the price of bread, since the margin between the price of wheat and that of bread would be increased by the rise in the remuneration of the millers and bakers.

But if there should be an increase in the number of bakers, the farmers and millers remaining the same, this would tend to reduce the remuneration of bakers and narrow down the margin between the price of flour and that of bread. There being more bakers, with no increase in the demand for their work, that of each one would be less wanted than it was before. It could be spared with less loss, and consequently less would be paid to each baker to induce him to work. The effect of this would be both to reduce the price of bread and to increase that of flour. If the price of flour should for a time remain the same, and the whole of the fall in the remuneration of bakers be taken out of the price of bread, the cheapening of bread would tend to increase its consumption. But this could not continue without more flour, which would not be forthcoming unless some slight additional inducement were offered to the farmer and the miller in the way of higher prices. The increase in the consumption of bread would therefore tend to increase the demand for flour and wheat, which in turn would increase the demand for the labor of the farmers and millers.

But if the whole of the saving in the cost of baking should be for a time added to the price of flour, leaving the price of bread unchanged, this would stimulate the millers, and finally the farmers also, to increased activity and call forth a somewhat larger supply of wheat and flour. But this could not be disposed of unless the price of bread should fall sufficiently to induce a larger consumption. Thus the saving in the cost of baking would be divided among the consumers of bread in the form of somewhat lower prices, and the producers of wheat and flour in the form of somewhat higher prices. Similarly, an increase in the number of millers would tend to increase the demand for the work of both farmers and bakers, besides lowering the price of bread.

In the chapter on Value[1] we found that, other things equal, an increase in the supply of one commodity constitutes an increase in the demand for others which are exchanged against it provided they are not substitutes for it. This is a universal principle, and applies to agents of production, including labor, as well as to consumable commodities. But the principle applies with special force in the case of several commodities or agents of production which have to be combined for the accomplishment of the

[1] p. 22.

same purpose.[1] Both sand and lime, for example, have to be used in the making of mortar. If no sand were to be had, nor any substitute for it, some other building material than mortar would have to be used, and there would therefore be no effective demand for lime for that purpose. At least, no one would be in the market buying it for that purpose. Even if a small amount of sand could be had at a high price, it would make mortar so expensive that comparatively little would be used, and there would therefore be little demand for lime for that purpose. But with an abundant supply of sand at a low price, mortar could be used freely as a building material, and there would be a considerable demand for lime, tending to raise its price.

The same principle applies to different kinds of labor which have to be combined for the accomplishment of the same general purpose, as is the case with that of the farmer, the miller, and the baker. It applies also to different kinds of capital, and to combinations of labor, land, and capital in the same industry. An increase in the supply of capital helps the price of labor in precisely the same way that an increase in the supply of sand helps the price of lime, or as an increase in the number of bakers

[1] Cf. Marshall's theory of joint demand, "Principles of Economics," Book V, Ch. VI.

helps the price of the labor of farmers and millers. But the effect of this principle is limited somewhat by the fact that one thing can sometimes be used as a partial substitute for another. Where two or more factors are combined for the production of the same result, it sometimes happens that the proportion in which they are combined can be varied, as was found in the chapter on Diminishing Returns. When this is the case, if one factor gets cheaper, the tendency is to use more of it and less of the others. But there is always a limit to this power of substitution, and in many cases no such substitution can be made.

But the case of the farmer, the miller, and the baker is an abnormally simple one as it has been stated, for the reason that no account has been taken of the fact that no one works alone and unaided. It has been assumed that the farmer, for example, produces a certain quantity of wheat and markets it without any help from any one else. Under such conditions his earnings would be easily distinguishable from those of the miller and the baker, who each in turn, in the same independent manner, buy their raw materials and market their products. But such simple conditions are never found in reality. The farmer is always at some expense for his tools, the miller for his machinery, the baker for his ovens, and all alike for the land upon which they work.

These expenses must be deducted before we can find the net earnings of these three men. That is to say, the makers of the tools, machinery, and ovens also get a share of the value of the bread. The owners of the land will also exact a share, and in case the producers own their own land they will usually have been at some expense in acquiring it, and this expense must be deducted before we have the real earnings of their labor. In other words, the interest of capital and the rent of land, as well as the wages of labor, come out of the total value of the product.

All that was said regarding the process of determining the individual shares of the farmer, the miller, and the baker, strictly applies only to the shares of the farming group, the milling group, and the baking group, each of which combines a number of coördinated factors usually classified as labor, land, and capital. We have still before us the problem of finding how the share going to any of these groups is divided among the factors of which it is made up. This is a more difficult problem than the last because the market does not separate the product of each factor, as it does that of each group. The specific problem of the present chapter is, What determines the share which goes to the laborer in the form of wages?

In approaching this problem it is necessary to return to the elementary proposition which was made the starting-point of our explanation of value, viz., that the value of an article depends upon how much it is wanted in comparison with other things. This applies to labor as well as to commodities. The share going to the wheat-flour-bread-producing group depends, as we have seen, upon how much bread is wanted in comparison with other things, or upon the value of bread; but the share of this total amount which goes to any one of the factors depends upon how much that factor is wanted in comparison with the others. If the services of a given amount of labor are wanted more than the uses of a given amount of land or of capital, more will be paid for the labor, and it will get a relatively large share of the value of the joint product. But if the services of the labor are less wanted, less will be paid for it, and it will get a relatively smaller share of the joint product than the landowner and the capitalist.

How much any factor of production is wanted will ordinarily depend upon how much it will add to the product of the group with which it is combined, or to which it is added. To be sure, a handsome tool yields a certain amount of direct satisfaction to the mechanic, as a handsome team does to the farmer, and such things will, on that account, have a some-

what higher value than less handsome ones, even when the latter will do as much work and add as much to the product of the group to which it belongs. But in general, the desire for a piece of producers' goods is based upon its efficiency in production rather than upon its ability to please. If, therefore, in the above illustration, the given quantity of labor, when added to an existing industrial unit, such as a farm, will add more to the total product of the farm than would be added by the addition of the given amount of land or capital, the labor will be more wanted by the owner of the farm, and he will therefore pay it a larger share of the value of the total product of the farm. The same rule can be stated in another way. If the loss of the given amount of labor from the farm would reduce the total product more than the loss of the given amount of land or capital, the head of the farm will want it more, and will therefore offer more to retain it. Stated in either way, this rule applies only to definite units of labor, of land, or of capital, since the loss of all the labor, of all the land, or of all the capital would destroy the product altogether. But this need give us no difficulty if we only remember that these factors, in society at large if not on a single farm, are bargained for in units, and not in the mass.

In order to understand how the amount which any factor adds to the total product of all the factors is determined, it is necessary to recall the law of diminishing returns and the principle of marginal productivity which is based upon it. In the chapter on that subject we found that the owner of a farm, a factory, or any other industrial unit, could best afford to employ that amount of labor which would have a marginal product equal to the wages which he would have to pay.[1] This assumes, correctly enough for the purpose then in hand, that the rates of wages were fixed in the community at large outside the individual establishment in question, and that larger or smaller amounts of labor might be employed according as the owner's interests would dictate. That is, with the productivity of the establishment under varying applications of labor, and with the rate of wages known, the problem was to find the amount of labor which he could most profitably hire. But in society at large a different set of conditions prevail. There is, at any one time, a certain amount of land and capital of certain varying degrees of productivity, and there is also a certain amount of labor to be employed upon that land and capital, but the rate of wages has to be determined. The productivity of the land and capital and the

[1] Cf. pp. 78–79, Chapter II.

amount of labor are the fixed factors from which the variable factor wages is to be found. In this case the rule is that a rate of wages will be paid which will be approximately equal to the marginal product of labor.

In order to simplify the problem, let us assume for the moment that the conditions which prevail in the community at large prevail also with respect to a single farm. The first settler on the farm is presumably its owner and able to control it and its product. If he can when working alone produce a crop of 500 bushels, and if when working with another man the two could produce a crop of 900 bushels, the amount added by the second man (or the marginal product of labor) would be 400 bushels. More than this the owner could not afford to pay, because to do so would leave him less than he might have by working alone. Anything less than this he could afford to pay, because to do so would leave him something more than he could have by working alone. Assuming that the owner does not exercise a monopoly power by forcing the laborer to take less, the wages of the second man would approximate this amount. Then if a third man came seeking employment, and if the three together could make the farm yield 1200 bushels, the most that the owner would feel like paying him would be 300

bushels. That is the amount, under the assumption, which he adds to the product of the other two, and it now becomes the marginal product of labor. More than that the owner would not pay, because to do so would leave him less than he might have without this last man. But if the third man consents to work for 300 bushels, the second man will soon have to come down to the same figure, for the farmer will discover that he and the third man could produce 900 bushels, while all three together can produce only 1200. He would, therefore, figure out that he would be better off without the second man unless he could get him for 300 bushels or less. Unless, therefore, the second man will accept that amount, he will have to go; but as conditions exist in the world at large, he will have no place to go, and he will therefore probably accept.

This does not mean that there are no other lands upon which the second or third man may work and get all the product, as the owner of this farm did when he worked alone. But at any one time the best lands will have been appropriated, so far at least as it is known what lands are the best, and only inferior lands will be open for this kind of settlement. Their inferiority may be either temporary — due to present lack of transportation facilities, to ignorance

of the proper methods of cultivating these vacant lands, or the lack of sufficient capital for their proper utilization — or it may be permanent — due to the natural sterility of the soil, to the insalubrity of the climate, or to natural and irremovable difficulties of access. For the time being, at any rate, they are less inviting than the lands which have been already appropriated, and the later comers — the second and third men — may find it to their advantage to work for the first man, receiving wages, rather than to appropriate such lands as are still open to settlement. However, this will depend partly upon the wages which the first man can find it to his interest to pay, and partly upon the productiveness of the lands which are still open. If there is a reasonable hope that they might be able to produce on the new land as much as, or more than, they can get in the form of wages by working for the first man, they will probably choose to work the land; otherwise they will probably work for wages.

The fact that there is, in every country, some land which is so poor that its use can be had for little or nothing, together with the fact that there are numerous owners of farms each of whom is anxious to increase his income, will operate to prevent the beating down of wages much if any below the marginal product of labor. Each farm owner would increase

his income by hiring more men if he could get them for less than their marginal product. The competition for men, if wages should be found to be below that point, would force wages up. But if they should be found to be above that point, the unwillingness of the farmers to hire men would bring wages down. The normal tendency, therefore, is for wages in agriculture to proximate pretty closely to the marginal productivity of labor. Other things equal, the more labor there is in proportion to the land and capital the lower will be its marginal productivity, and the less, therefore, will any unit of labor be wanted. This is a necessary result of the law of diminishing returns.

All this is equivalent to saying that each individual laborer gets as wages approximately the equivalent of the amount which he individually can add to the product of the group to which he belongs, or of the amount which he can subtract from the product of the group by withdrawing himself from it. Find out what the group could produce without his help, and then find out what it can produce with his help, and the difference between these two amounts is the measure of his worth to the group — as a man's worth is calculated in the industrial world. But under the universal law of diminishing returns, the more there are doing the same kind of work that he does in

comparison with the other factors in the same group, the less difference will his presence or absence make; and *vice versa*, the fewer there are doing his kind of work in comparison with all the factors in the group, the more difference will his presence or absence make in the total product.

Ignoring for the present the fact that there are many kinds of labor which coöperate with one another, in the same sense that land and capital in general coöperate with labor in general, the foregoing argument can be made somewhat more definite by the use of the following table. This purports to give the amounts which could be produced by varying numbers of laborers on four farms of different degrees of productivity, each containing 100 acres and having the requisite capital. The numbers are purposely made round in order to facilitate the calculations which are to be based upon them. On farm A, for example, the change from one to two laborers makes a difference of 400 bushels in the product, which then becomes the marginal product of labor, while the change from two to three laborers makes a difference of only 300 bushels, and so on, until, when the number of laborers is increased from four to five, the fifth laborer adds only 100 bushels to the total crop over and above what four could produce.

TABLE E

TOTAL CROP AND MARGINAL PRODUCT OF LABOR (BOTH IN BUSHELS) FROM FOUR ONE-HUNDRED-ACRE FARMS OF DIFFERENT PRODUCTIVITY WHEN CULTIVATED BY VARYING NUMBERS OF LABORERS.

Number of laborers	Farm A		Farm B		Farm C		Farm D	
	Total crop	Marginal product	Total crop	Marginal product	Total crop	Marginal product	Total crop	Marginal product
1	500		400		300		200	
2	900	400	700	300	500	200	300	100
3	1200	300	900	200	600	100		
4	1400	200	1000	100				
5	1500	100						

Now suppose that there are, in a given community, a number of farms of each of the four grades given in this table. So long as there is only one man for each farm of the A grade, the marginal product of labor would be 500 bushels. If any one of them should quit working his farm, he would cut down the product of the community by that amount. Moreover, no one could induce any one else to work for him for less than that amount, since each would have the opportunity of producing that much for himself. But if more men should come, their marginal product would be cut down to 400 bushels, because some of them would either have to take up land of the B grade, or work for wages on some of the

farms of the A grade. In either case, each one would be able to add only 400 bushels to the amount which the community could produce without him. And if the number of men should still further increase, until there were more than two men for every A farm, and more than one for every B farm, the marginal product would fall to 300 bushels, since the extra men would then have to take up land of the C grade, or else work for wages on the A or B farms. In either case each one would be able to add only 300 bushels to the total crop of the community. But inasmuch as one laborer may be as good as another whether he came with the first or the last instalment, all laborers who were not also owners of some of the better land will have to come down to the same wage. No matter whether he came with the first immigration when the marginal product was 400 bushels or not, he will find that under the new conditions only 300 bushels depend upon his work. That is all the community would lose if he were to stop, and no device has yet been found which will enable a laborer to secure more than that. Following out the argument according to the table, the number of laborers might increase until their marginal product fell to 200, or even 100 bushels.

Strictly speaking, even the wages of the owners themselves would fall as the number of laborers

increased, though this would be more than compensated by the increase in their rents, or the shares which they would be enabled to secure by virtue of their ownership and control of the land. When the marginal product and the wages of labor are 300 bushels, the owner of one of the A farms, for example, could stop working himself, and it would only make a difference of 300 bushels in his income. That is all, therefore, which comes to him because he chooses to work; the rest of his income is wholly the result of his ownership. At that rate of wages he can either hire two or three men, and in either case his income will be 300 bushels. In the former case the total crop would be 900, and the labor cost 600 bushels, and in the latter case the total product would be 1200 and the labor cost 900 bushels. Or, he could hire two men and also work himself and get an income of 600 bushels. Clearly, therefore, 300 bushels are due to his labor and 300 to his ownership. But when there are so many men that the marginal product is only 200 bushels, — that is, when there are four men to every such farm in the natural distribution of workers, the total wages are only 800 bushels as against a total crop of 1400 bushels, leaving 600 bushels as rent which the owner can secure whether he works or not, or in addition to his wages if he chooses to work.

The effect of an increase in the number of laborers, in proportion to the number of farms upon both wages and rent, can be seen by a study of the table on page 163, which is only an enlargement of the last one.

To simplify the case as much as possible, let us assume that these four farms include all the land in a microscopic community, and that the number of men gradually increases, beginning with one. The first man would naturally work on farm A, and there would be no rent at all, or at least none that could be distinguished from wages. With a community of three men, two would naturally work on farm A and one on farm B, in which case the marginal product and the wages would be 400 bushels per man, and farm A would yield a rent of 100 bushels, or one bushel per acre, while farm B would yield no rent at all. With six men, three would naturally work on farm A, two on farm B, and one on farm C, in which case the marginal product would be the same on all three farms, viz., 300 bushels, and farm A would yield a rent of 300 bushels, farm B of 100, and farm C none at all. When there were ten men, four would naturally work on farm A, three on farm B, two on farm C, and one on farm D, in which case the marginal product would be only 200 bushels, and

TABLE F

TOTAL CROP, MARGINAL PRODUCT OF LABOR, TOTAL WAGES, AND RENT (ALL IN BUSHELS) FROM FOUR FARMS OF DIFFERENT PRODUCTIVITY WHEN CULTIVATED BY VARYING NUMBERS OF LABORERS.

Number of laborers	Farm A					Farm B					Farm C					Farm D				
	Total crop	Marginal product	Total wages	Total rent	Rent per acre	Total crop	Marginal product	Total wages	Total rent	Rent per acre	Total crop	Marginal product	Total wages	Total rent	Rent per acre	Total crop	Marginal product	Total wages	Total rent	Rent per acre
1	500					400					300					200				
2	900	400	800	100	1	700	300	600	100	1	500	200	400	100	1	300	100	200	100	1
3	1200	300	900	300	3	900	200	600	300	3	600	100	300	300	3					
4	1400	200	800	600	6	1000	100	400	600	6										
5	1500	100	500	1000	10															

the rent of farm A 600, that of B 300, that of C 100, and that of D none at all. Fifteen men would distribute themselves as follows: five on A, four on B, three on C, and two on D; wages would be 100, and the rents would be 1000, 600, 300, and 100, respectively. The total wages are found in every case by multiplying the marginal product by the number of laborers, and the rent by subtracting the total wages from the total product. That this process is capable of being reversed by finding the marginal product of land, and then finding the total rent by multiplying the marginal product by the number of acres, and the wages by subtracting the total rent from the total product, we shall see when we come to the chapter on Rent.

By changing the headings, these tables can be made to apply to factories or any other class of industrial establishments, as well as to farms, for the same general law governs wages in them all, and in society at large. This law is that a given unit of labor of any kind is valued in industry according to the amount which it can add to the total product of industry, or the amount which can be produced with this unit over and above what can be produced without it. But owing to the law of diminishing returns, that amount diminishes as the number of the same kind of units

increases in proportion to all the other factors, including other kinds of labor; and, conversely, that amount increases as the number of similar units diminishes in proportion to all the other factors. In other words, the wages of any particular kind of labor are determined by its marginal product, and that marginal product diminishes as the supply increases relatively to the other factors, and increases as the supply diminishes relatively to the other factors. The wages of any particular kind of labor depend, therefore, quite as much upon its supply as upon its demand. We have seen that the demand is based upon its marginal product, and we have yet to see upon what its supply depends, for labor, like all the other factors, must be limited in supply in order that it may command a price.

In the first place, the supply of labor is a quantity of two dimensions, and each dimension is limited by a somewhat different set of circumstances. The total supply of labor may be increased either by increasing the number of laborers or by increasing the intensity with which each labors. By intensity we mean the amount of productive energy expended by each laborer. The time during which he works is one of the factors of the intensity. That is to say, the intensity is

increased either by working longer hours, or by working harder during the same number of hours. The supply of labor is reduced somewhat by a reduction of the number of hours per day, provided the rate or speed is not correspondingly increased. This conception of intensity is somewhat at variance with the quantitative notions of labor as given us by Jevons.[1] He regarded the quantity of labor as the product of time and intensity, and intensity as consisting either in the quantity of work done or in the painfulness of doing it. The painfulness of labor does undoubtedly help to limit the amount of labor performed, but it does not seem expedient to regard the painfulness itself as a part of the quantity of labor. Besides, the painfulness of labor limits the time quite as effectively as the rate of labor. On the whole, it seems better to treat both the time and rate of labor under the head of intensity, since the same cause, viz., painfulness, limits both. It is immaterial to the laborer whether he works long hours at a slow rate or short hours at a rapid rate, provided the pain or sacrifice is equal in both cases.

Any treatment of the subject of wages which ignores the question of numbers is incomplete. If we conceive of a man as living alone in a Robinson

[1] "Theory of Political Economy," London, 1879, pp. 184–185.

Crusoe state, the question of numbers might very well be ignored, and the subject be treated simply from the standpoint of a calculus of pleasures and pains. There would then be no question of distribution, and the reward of labor would be purely a matter of production. We might then stop when we had shown that the laborer would quit working when the painfulness of further labor would outweigh the pleasure to be derived from the further earnings. But, when other laborers enter upon the island, a new element is introduced. The question of the reward of labor is still a question of production, but of production under changed conditions, — that is, it becomes a question of marginal production. Each laborer has more limited means at his disposal, and also has a chance for coöperation and a division of labor. The introduction of numbers gives rise to a question of distribution, not only as between man and man considered as laborers, but also as between man and the other factors of production.

As already suggested, the intensity of labor is regulated by the pain or the sacrifice involved in labor. The amount of work which any laborer will perform in a given time is limited, not by his absolute capacity, but is kept within those bounds by the sense of fatigue and other disagreeable results of

work. The total sacrifice consists not only in the positive pain of weariness, but in the confinement which prevents the laborer from the fullest enjoyment of his earnings, and in a number of other disagreeable features. Still, the factors which regulate the intensity of labor are comparatively simple. But the factors which regulate the other dimension of the supply — namely, numbers — are more complex and vary somewhat among different occupations. With labor in general, the question of the limitation of this dimension of the supply is mainly involved in the question of population. The share of the total product of industry which goes to labor, as compared with the shares which go to the other factors, is therefore largely a question of the relation of population to the natural resources plus the accumulated capital; but the share which goes to one class of laborers, as compared with other classes, is not always a question of population in general, but is usually a question of the distribution of the population among different classes of occupations. We have first to consider the broader problem of the share of labor in general as compared with those of land and capital, and as furnishing the key to that problem we must consider the general law of population.

This law, first systematically worked out by Mal-

thus, and never successfully refuted, may be briefly stated as follows: —

(1) Every species of plant and animal has the power to multiply faster than its means of subsistence will permit.

(2) The physiological power of human increase is also so great that if it should operate without moral or social restraints of any kind, it would carry population to such limits that vice or misery or both would begin to thin out the people and thus operate as a check upon further increase.

(3) Owing to the law of diminishing returns, a larger number of people can not, in any given state of civilization and the industrial arts, be so well provided for as a smaller number.

(4) There is a strong natural instinct which inclines the members of our species to the multiplication of numbers, and unless this is counteracted by other motives, it will lead to an increase of population beyond the limits where comfortable subsistence is possible.

(5) This natural instinct is, however, opposed and held in check by several contrary motives, not the least important of which is the desire for the customary goods to consume, coupled with the perception on the part of each head, or would-be head, of a family that a larger number of children means a

smaller share of the necessaries, comforts, and luxuries of life for each one, and this keeps the rate of increase far below that which is physiologically possible.

(6) How rigidly the increase of numbers is held in check by this motive depends upon the ideas of the people as to what is essential, in the way of incomes, to their happiness, — in other words, upon their standard of living. It is the standard of living, therefore, which determines the rate of increase of population, when we have given the amount of wealth and the possibilities of production. It plays the same part in determining the supply of labor which the cost of producing commodities plays in determining their supply.

The standard of living means, technically, the number of other wants whose satisfaction the individual considers of more importance than that of the procreative instinct. The individual who places very few wants before that instinct has a very low standard of living, and he who places many wants before that one has a high standard. Whenever the individual with a low standard is reasonably certain of having enough to satisfy the few wants which he considers more important than the procreative instinct, he will usually undertake the rearing of a family. Where the average standard of

living is low throughout a whole community, or any considerable class of the community, population will increase so rapidly that, under the law of diminishing returns, that part of the population which has to work for wages will be reduced to the point where it can only maintain its low standard of living. But where the average standard of living is high, numbers will not increase beyond the point which will enable the laboring population to live up to its standard, unless the immigration of laborers of a lower standard from some other community should set in, in which case the laborers of a lower standard will displace those of a higher standard, causing the latter to migrate or stop multiplying, leaving the field ultimately in the possession of the low standard, as surely as cheap money will drive out dear money, or as sheep will drive cattle off the western ranges. Thus under the system of private property and the present constitution of the family, both of which combine to place the responsibility for the support of the family upon those who are responsible for its existence, the standard of living determines the abundance or the scarcity of labor, and indirectly, the rate of wages.

Consistently with the cost of production theory of value which he held in common with the other

classical economists, Ricardo endeavored at some length to show that the natural price of labor is fixed by the cost of producing laborers. "The natural price of labor is that price which is necessary to enable the laborers, one with another, to subsist, and to perpetuate their race without either increase or diminution." In his subsequent argument he considerably modified this rigid form of statement by showing that this price depends largely upon what the laborers themselves consider necessary. Yet in the end he left no doubt that he believed that the tendency was in the long run to force the standard of living down to a subsistence minimum. Though Ricardo's form of statement is the more rigid, yet practically the same opinion had been common to his predecessors, including Adam Smith. To Malthus, contrary to the popular impression, belongs the credit of having first made a thorough application of the standard of living to the wages question. He, perhaps, more than any one else, insisted upon the possibility and the importance of raising the standard of living of the laboring classes by education and more liberal surroundings, so that an effective prudential check on population would be introduced. In common with the other early economists he concurred fully in the cost of production theory of wages; yet he explained more

fully than any one else in what the cost of production of labor consisted — that it meant, in fact, simply the standard of living of the laborers.

So long as we limit the discussion to the general class of unskilled laborers, the correspondence is tolerably complete between the cost of production of other commodities and the standard of living of laborers. The one operates in essentially the same manner upon price as the other does upon wages.

(1) A rise in the standard of living of laborers tends to reduce the amount of labor that will be supplied at any given rate of wages by diminishing the birth-rate, just as a rise in the cost of production of another commodity will reduce the amount of that commodity that will be supplied at any given price.

(2) With a given standard of living, a rise in the rate of wages will result in a higher birth-rate and a larger supply of labor, just as, with a given cost of production, a rise in the price of another commodity will result in a larger production of that commodity.

(3) The laborer does not consciously estimate what it has cost to produce him, and then set the price of his labor accordingly. Neither does the farmer thus set the price of his wheat. In either case, production precedes sale; and the seller gets all he can, regardless of the cost of production. But in either case, if the sellers are unable to get enough to induce

a continuance of the same rate of production, the supply will eventually be diminished until the price does become a sufficient inducement to continue production. Though the nature of the motives that operate in the two cases are quite different, the effect on price is quite similar.

(4) It must be conceded that the standard of living is not the only factor that limits the number of laborers. On the outside is the limit set by the physical capacity for human increase. But one of the important differences between economic man and the uneconomic animals is that with man reproduction does not begin so early nor continue so rapidly as is physically possible. But numerous other causes than economic considerations doubtless check population within the outside limits set by nature. For a variety of reasons society has placed its condemnation upon extremely early marriages. There are other legal and social restraints that also operate in the same way. With equal justice may it be said that cost of production is not the only factor that limits the supply of any commodity. With every commodity there are certain outside limits set by nature, and in many cases there are legal and social restraints. But within these bounds cost of production does operate. In fact, it operates to such an extent that the supply never reaches these outside

limits, so that all other factors become *practically* inoperative. Similarly, with population. Economic considerations, — the fear of lack of means of subsistence, according to prevailing standards, — operate to limit population within the bounds set by other factors, so that they become *practically* inoperative; and the standard of living becomes the efficient cause for the limitation of numbers. After allowance is made for all other possible checks, the fact remains that the standard of living operates as a still further check. It adds considerably to the height of the dam that keeps back the flood of possible human increase. The plain question of bread and butter enters into a man's calculations even on the subject of matrimony. If the man's standard of living includes not only butter on his bread, but jam on his butter, it is then a question of bread and butter *and jam* that enters into his calculations. In other words, if the question of means of living enters into his calculations at all, it must be a question of living according to some standard; and it makes a vast difference whether that standard be high or low.

The present tendency of economic science is toward a study of man as the economizer, the satisfier of wants, the chooser between pleasures and pains. Therefore, we may, with perfect propriety, treat man's domestic in common with his other wants, and

study his satisfaction of these wants as a part of his economic activity. In accordance with the principle of the declension of utility and the satiation of wants, a man will procure first the thing that satisfies the most pressing want. But after a time that want becomes so far satiated as to be less pressing than another. Then the man's attention will be turned to the satisfaction of the next, and so on. A man will probably be sure of a certain amount of bread before he tries to procure butter. But, when his economic condition assures him of a partial satisfaction of his desire for bread, his desire for butter becomes stronger than his desire for an additional piece of bread. Then he will procure butter also. In the same manner, after his desire for bread and butter is assured of a certain degree of satisfaction, another desire — for example, that for jam — becomes effective in giving direction to his activity; and thus, as his economic condition continues to improve, a larger number of desires rise above his horizon, and become effective in directing his economic activity. Somewhere in the scale of desires his domestic affections have a place, and become effective in their proper order. The position of this particular class of wants in the scale makes what is called the standard of living. Thus it will appear that a high standard of living when referred to the question of population

may mean one of two things. It may mean that the general scope of the people's wants has been widened and deepened, or that the domestic affections[1] have been weakened, or both. On the whole, we have every reason for believing that the standard of living acts as an effective check on the increase of numbers and the supply of laborers in general.

While it is undoubtedly true that wages must in the long run be high enough to repay the cost of producing laborers, yet it does not follow that the standard of living of the laborer *directly* fixes the rate of wages. The fact that a man has high standard of living will no more enable him to get high wages than the fact that an individual bushel of wheat cost the producer a great deal will enable him to sell it at a high price. The standard of living of laborers and the cost of producing wheat only affect wages and the price of wheat by limiting the quantity supplied.

An obstacle to the perfect working of this law as applied to labor is the length of time necessary to

[1] For want of a better term we are compelled to use the term "domestic affections" in a somewhat general sense, including the sum total of those motives which impel toward marriage and the begetting of offspring. If we distinguish between the animal passions and the higher domestic affections, we shall find that the latter quite often check rather than increase population by making parents more considerate of the future of their children, and unwilling to risk their best interests by having too many to provide for.

greatly increase or diminish the total supply of labor. Population changes very slowly, though the fund of unemployed labor may act more quickly on the supply. But it will be difficult to find two commodities whose supplies can be increased or diminished with precisely the same degree of expedition. Labor is simply an extreme case among those commodities whose demand and supply are very slowly adjusted to one another. Yet there is the same tendency for such an adjustment to take place as has long been observed in regard to other commodities. But, in the case of wages, another fact affects the adjustment. A change in the rate of wages so slowly affects the population that the standard of living of the laborers may itself change before the change in the supply brings wages back to the former level. The harshness of the "iron law of wages" is materially softened by the fact that in a free society, and especially in a country of universal education, the standard of living is more easily raised than lowered. The tendency of freedom is to encourage aspirations and ambitions, while the inevitable result of education is to broaden the mental horizon and develop new desires. The inherent optimism of Malthusianism, when properly understood, appears in this connection. To this end Malthus became an apostle of free institutions and political equality, as

being conducive to the development of self-respect, dignity, and thrift on the part of the laboring classes. He attributed habits of improvidence and other proletarian vices to "despotism, oppression, and ignorance." It is something more than mere prediction to suggest that along the lines of liberal surroundings, education, and culture lies the ultimate solution of the labor problem.

Though the rule that a laborer generally gets the equivalent of the marginal product of his kind of labor is of universal application, we have found that, so far as the general class of unskilled laborers are concerned, that marginal product is in part determined by the number of such laborers, which is in turn very largely determined by their standard of living. We have yet to consider what additional factors limit the numbers in those trades and callings where marginal productivity and wages are high. Since it is sometimes possible to change from one occupation to another, there must be something besides the standard of living to limit the numbers in the more remunerative callings.

Perhaps the most unfortunate result of too rigid an adherence to the "cost of production" theory of wages appears in discussions of the causes of differences of wages in different occupations. Adam Smith lays down the proposition that "the

whole of the advantages and disadvantages of the different employments of labor and stock must, in the same neighborhood, be either perfectly equal or continually tending to equality. If in the same neighborhood there was any employment either more or less advantageous than the rest, so many people would crowd into it in the one case, and so many would desert it in the other, that its advantages would soon return to the level of other employments."[1] In his enumeration of the principal circumstances which "make up for a small pecuniary gain in some employments, and counterbalance a great one in others," he names "the small or great trust which must be reposed in those who exercise them." This contains the rather startling implication that it is a disadvantage to have confidence placed in one's self. This is manifestly carrying the cost of production theory a little too far. Moreover, in the other circumstances which he names, he assumes that the difference in the wages between skilled and unskilled occupations is entirely due to the difference in the expense of learning them. But the difference in wages will in many cases prove out of all proportion to the difference in the expense. It would be just as easy to account for differences in the rent of real estate on the basis of the difference in the cost

[1] "Wealth of Nations" (Rogers ed.), Vol. I, p. 103 *et seq.*

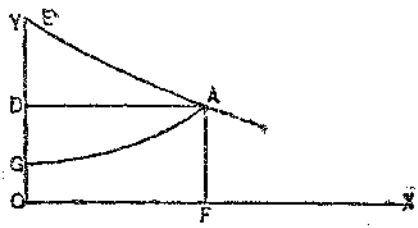
of the improvements. In the case of labor, account must be taken of differences in native and hereditary qualities, just as we must take account of difference in situation and "original and indestructible powers of the soil" in the rent of land.

The marginal productivity of labor of any class determines the rate of wages of that class. But, with different kinds and qualities of labor, there are different causes for the limitation of the supply. Hitherto we have simply discussed the causes which limit the general class of unskilled labor. When we consider the supply of skilled or professional labor, we shall find some new factors entering in. There are certain forms of ability so unique and exceptional that it is practically impossible either to increase or diminish the supply. Nature seems to have set the limits, and the possessors of such qualities enjoy a monopoly as absolute as the possessor of meteoric iron or a Sistine Madonna. There are other orders of ability that are capable of cultivation to a more or less limited extent. It is perhaps possible for the average man to acquire proficiency in any of the majority of skilled occupations, if he trains long enough and carefully enough. But different men can acquire proficiency in a given skilled occupation with different degrees of expense, owing to differences in natural talents. The tendency will be for

as many men to go into that occupation as can do so with advantage to themselves. But, when those best fitted for it have gone into it, it begins to cost the additional men more and more in the way of preparation. Finally, the man will be reached who is so ill adapted for that line of work that it will cost him in preparation all that he will ever gain from it. Here the supply of that kind of labor will cease; and its rate of wages will be measured by the *productivity*, as well as by the *expense*, of the marginal increment. Those who are able to acquire proficiency in that line of work at a less cost than that which the marginal man must undergo, enjoy a surplus analogous to rent for their personal qualities.[1]

The nature of what is usually termed superior ability or talent needs examination. It may mean

[1] This may be illustrated by the following diagram. Let the number of laborers be measured along the line *OX*, and the productivity along the line *OY*. The line *EA* will then represent the declining productivity, and *GA* the increasing cost, of successive laborers, in which case the supply will be measured by *OF*, the rate of wages by *OD*, and the sum of personal rents by *GDA*.



the capacity for exerting an absolutely greater amount of productive energy, or it may mean simply the possession of a kind of ability that is scarce, and because of its scarcity commands a high price in the market. The difference is of some importance. Where two men are engaged in entirely dissimilar occupations, it is practically impossible to determine which exerts the greater amount of productive energy or whose absolute productivity is greater. If we compare two bricklayers, and find that one can lay on the average three thousand, and the other only two thousand, bricks in a day, it is quite safe to say that the absolute productivity of the former is the greater. But, if we compare a bricklayer with a bank cashier, we have not the data for a similar comparison. It is impossible to say with certainty that the work of the cashier is absolutely more productive than that of the bricklayer. The probabilities are that it is not. If the cashier gets better wages than the bricklayer, it is not due to any absolutely superior ability, but because the kind of ability possessed by the one is less abundant than that possessed by the other. If the jeweller gets better wages than the baker, it is probably for the same reason that an ounce of silver sells higher than an ounce of bread. This is not because the absolute utility of silver is greater, but because, owing to

differences in the scarcity, its marginal utility is greater.

To sum up, we conclude that the marginal productivity of labor is the factor that is present in all cases in the determination of wages, that the standard of living and the painfulness of labor are the efficient causes for the limitation of the supply of labor in general, that the marginal cost of acquiring proficiency in the skilled occupations is the efficient cause for the limitation of the supply of specially skilled labor, and that there is an element of "rent" of personal ability as well as of land.

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CHAPTER V

RENT

LABOR and land are the original or primary factors of production, capital being a secondary factor produced by the other two and in turn aiding them in the work of further production. One peculiar thing about land is its quality of extension which it possesses in greater degree than other forms of wealth. Under our present laws of property this gives its owners control over certain productive forces and desirable objects which nature alone can supply and which she has chosen to scatter over such wide spaces that they can only be utilized in connection with considerable areas of the earth's surface. They include such things as sunlight and heat, rainfall, and even the atmosphere itself, to say nothing of mineral deposits, soil, and scenery. These things all exist in considerable abundance — some of them in such abundance that they could have no value when dissociated from the land; but ground space is necessary in order to utilize them, and ground space is limited — so limited as compared with the demand

for it in certain parts of the world that vast sums are paid for it. These productive forces are in reality parts of the land, being mere appurtenances of those areas over which nature has seen fit to scatter them.

However, nature has not distributed them with absolute impartiality over the entire surface of the earth, some parts being favored above others. In every settled community, location also becomes a factor of great importance in determining the superiority or inferiority of different areas of land. The question of the quality of the land depends, therefore, upon a number of factors, all of which affect in some way the value of the product which it will yield in proportion to the cost of cultivating or utilizing it. The product may be agricultural, mineral, or manufactured goods. Proximity to market and cheapness of transportation are therefore as important as soil or climate in determining the quality of the land.

It would be easy to picture a community, and perhaps not so very difficult to find one, in which land is so abundant as not to count as a factor of production at all, being classed as free goods along with air in most places and water in mid-ocean. But very soon in the development of such a community two things will happen: first, the most favored spots

will be appropriated, so far as it is known what are the most favored ones, leaving the increasing population access only to the less favored ones; second, in order to provide for the growing wants of the people, those most favored spots will be cultivated beyond the point where the law of diminishing returns begins to operate. Until this time arrives, land would not count as an economic factor at all, and there would be no occasion to economize in its use. None of it would command a price so long as there was other land just as good not yet appropriated and to be had for nothing.

Excepting such land as is used for parks, pleasure grounds, dwelling sites, and other similar purposes, any particular acre of land, like any other factor of production, is wanted only for what it will add to one's income, — that is, for what it will yield over and above the cost of using it. But the cost of using it resolves itself into the amount which the labor and capital used in its cultivation could produce elsewhere. If there are few other opportunities for employing labor and capital, and their possible earnings consequently small, little will be sacrificed in withdrawing them from other lines of work in order to employ them on the land in question. Whatever they can produce on this land over and above that amount is therefore an additional income to their

owner, and is due to his use of the land. But if there are many and excellent opportunities for the employment of one's labor and capital, and their earnings consequently large, much will be sacrificed in withdrawing them from those other possible openings, and only the surplus above this large amount which they can produce on a given piece of land could count as the earnings of the land, or as the addition to one's income which comes to one through the use of the land. As already pointed out, the land is wanted only because of this surplus.

If a certain individual, with a given amount of labor and capital at his disposal, can earn $1000 a year by working for other people, it will be for the reason that he and his capital can add that much to the product of some industrial establishment over and above what it could produce without them. A piece of land upon which he with his capital could produce a total crop worth only $1000 would be worth nothing to him, but one upon which he could produce a crop worth $1200 would be worth approximately $200 a year. If, however, conditions should change so that he with his capital could only earn $800 a year elsewhere, then the land upon which he could produce a crop worth $1000 would be worth approximately $200 a year to him, while land upon which he

could produce $1200 would be worth $400 a year. These are the amounts which he would logically have to attribute to his use of the land in question, the rest of his gross income being attributable to his labor and capital.

Until the time arrives when the best grade of land is all appropriated and cultivated beyond the point of diminishing returns, no particular acre or parcel of land could add anything to one's income over and above what one could secure without it. Nor could it add anything to the total product of the community. So long as there is other land of the same grade still appropriable, as much could be produced without any particular acre as with it; and so long as the best grade of land is not cultivated up to that degree of intensity where it begins to yield diminishing returns, it would subtract nothing from the total product of the community to have some of the land thrown out of cultivation, and all the labor and capital employed on the remaining land. If any of it were withdrawn from cultivation, the labor and capital which had cultivated it could either be employed on some other land already under cultivation, adding to the product of this land as much as or more than it had been producing on the land from which it was removed, or it could move over on to another unappropriated and equally good piece of

land where it could produce just as much. The total product of the community would not be affected by the use or disuse of the land in question.

But when all the best land is appropriated, and is being cultivated beyond the point where diminishing returns begin, each acre of it becomes a matter of some consequence to the community. If one is withdrawn from cultivation, the labor and capital which were employed in its cultivation must then be employed either on some other land of the same grade, increasing the intensity of its cultivation and securing a smaller product under the law of diminishing returns, or on some of the second best land where it can not produce so much as it had been doing on the best grade. The withdrawal of the acre in question would therefore reduce the amount which could be produced in the community by the difference between what it would yield and what the same labor and capital could produce elsewhere. This would measure the marginal productivity of the land of the best grade, and the marginal product would determine the amount which any one would be willing to pay for its use.

In the last chapter we saw that the wages of any particular kind of labor depend upon its marginal product, — that is, upon the amount which any given unit could add to, or subtract from, the product of

the community by beginning or stopping work, and that this amount varies with the number of such units as compared with all the other factors. The same law applies to the rent of land. Let us for the moment make the extreme assumption that all the land in a certain community is of absolutely the same grade, differences of location being in every case exactly compensated by differences of fertility or some other advantage, and that there is an indefinite extent of it. Under such circumstances it would not be necessary to cultivate any of it beyond the point of diminishing returns; rather than to do so any cultivator would prefer to extend his cultivation over more land. Under these conditions the marginal productivity of land would be *nil*. Any particular piece of land could be spared without loss, since the labor and capital could find other land just as good upon which to employ themselves, and the total product of the community would not suffer in the least. But if the amount of land were so limited that it would be necessary to cultivate it beyond the point of diminishing returns in order to supply the demand for products, then each acre would become a matter of importance. Its withdrawal from cultivation would, as already shown, drive the labor and capital which had been cultivating it over upon the remaining land, increasing still further the

intensity of its cultivation and reducing the amount which could be produced by the community. And the scarcer the land is, the greater the resulting diminution in the total product when any given acre or parcel of land is withdrawn.

Referring again to Tables E and F in the last chapter, let us suppose that all the land in the community is of the grade of farm A, and that there is so little of it that two laborers have to be employed on each hundred-acre farm. There would then be a product of 900 bushels on each farm, and the marginal product of labor would be 400 bushels per man. But if one such farm were withdrawn from cultivation, the two laborers who had been employed in cultivating it would have to be employed on the remaining farms, probably distributing their work over a considerable number. Under these conditions they could not add to the product of these remaining farms more than 800 bushels, — theoretically a fraction less. There would then be a net loss of something over 100 bushels in the total product of the community. But if there were so many men or so few farms that three laborers would have to be employed on each farm, the total amount produced on each farm would be 1200 bushels, and the marginal product of labor on them all would be 300 bushels per man. Then if one farm were withdrawn from culti-

vation, these three laborers would have to be distributed over the other farms where they would add a fraction less than 900 bushels to the amount which was already being produced on them. In this case the loss of the farm would cause the community a net loss of something over 300 bushels. Thus, the more labor there is employed on each farm, and the lower its marginal productivity, the greater the net loss entailed by the withdrawal of any farm from cultivation.

It has sometimes been stated that rent is due to differences in the productivity of different areas of land.[1] This, however, is an unwarranted interpretation of the doctrine of rent as developed by Anderson and Ricardo, who did indeed assume, and correctly, that in any real community there are considerable differences in the productivity of the land under actual cultivation, and it was shown that these differences had something to do in determining the amount of rent. The rent of a given piece of land, for example, could not normally exceed the difference between the amount which could be produced upon it and the amount which the same labor and capital could produce on the poorest land in cultivation, or upon land so poor that its use could be had for nothing. But it does not follow from this that rent is due to these

[1] Walker's "Political Economy, Advanced Course," 3d Ed., N.Y., 1888, p. 197.

differences unless it is merely meant that however abundant and fertile the land in any community may be, if there are certain areas superior to the rest and so limited in extent as not to fully satisfy the demand for them, rent will be paid for their use. It is manifestly not true that rent is due to these differences if it is meant that rent would not exist if there were no differences, — that is, if land were all of the same grade. As shown above, if such land existed in such limited quantities that, in order to supply the demand for goods, it was necessary to cultivate it beyond the point of diminishing returns, it would all command a rent. It would, therefore, be more accurate to say that rent is due to the scarcity of land of the better grades, for this will give rise to rent whether there happen to be inferior grades or not.

But if there be inferior grades not yet in cultivation, some of them good enough to be worth cultivating if there is only a slight increase in the demand for products, or in the labor and capital to be employed, such an increase would bring some of these inferior grades into use and reduce the pressure upon the better grades. This will reduce the rent of the better grades below what it would otherwise be. Looked at merely from the standpoint of the law of demand and supply, the inferior lands would have to be regarded as partial substitutes for the better lands,

helping to satisfy the same demand, and therefore to relieve the scarcity of land.

Let the community previously assumed be regarded as an island community with no available land outside, and all the land within the island of absolutely the same grade. As population increases, the land must be more and more intensively cultivated and, in the absence of new improvements in the arts of production, the marginal productivity of labor must fall lower and lower. This, as already shown, will make the marginal productivity of land rise higher and higher. But if a new continent should be discovered within available distance, containing lands of various grades, some of them only a little inferior, all things considered, to that of the island, a part of the increasing labor supply could at once be transferred to the new lands, and a part of the subsistence of the population be derived from them. This would reduce the intensity of cultivation of the island, raise the marginal product of labor there, or at least check its decline, and reduce the marginal productivity of the land. In this sense the existence of differences in the productivity of different areas of land, instead of being a cause of rent, really helps to reduce rent, or at least to prevent its rise.

Referring again to Tables E and F of the preceding chapter: If the land were all of the same grade as

farm A, and there were three laborers for every such farm, the marginal product of labor would be 300 bushels per man, and that of land 300 bushels per farm. But if there were an indefinite amount of additional land of the grade of farm B, one man from each A farm would transfer his labor to a B farm, raising the marginal productivity of labor to 400 bushels per man, and lowering that of land to 100 bushels for each A farm, while the B farms would not have any marginal utility at all. But it is possible to assume that a given community has a fixed number of acres whether they are of the same grade or of different grades. In this case, differences in the productivity of the land would make the marginal productivity of labor lower and that of the better grades of land higher than they would be if it were all of the best grade. This, also, may be illustrated by Tables E and F. If the land were all of the A grade, and if there were two laborers for every such farm, the marginal product of labor would be 400 bushels, and that of land 100 bushels per farm. But if, with the same number of farms, half of them were of the B grade, the second man on each B farm might continue in the same place, in which case his marginal product would be only 300 bushels, or he might add himself as a third man to one of the A farms, in which case also his marginal product would be only

300 bushels. This would then set the rate for all the laborers, and this, in turn, would increase the marginal product of the A land to 300 bushels per farm.

Tables E and F were constructed on the assumption that varying quantities of labor are employed on a fixed quantity of land. It is quite as easy to vary the proportion between the two factors by assuming a fixed quantity of labor with varying quantities of land. Though in actual life it is not so easy to increase or decrease the amount of land in the community as it is the amount of labor or capital, yet in any industrial establishment, or in any industry as a whole, it is quite as easy. Moreover, in the community as a whole the amount of land in actual use varies slightly from time to time by reason of the fact that certain areas are withdrawn from cultivation at times, and again restored to cultivation. These variations are sufficient to enable the community to test the marginal productivity of the land. By constructing a table on the assumption that a fixed quantity of labor is employed on varying amounts of land, we can illustrate the method of finding the marginal productivity of land as that of labor was found in the preceding chapter. The wages of labor can then be determined by a method precisely similar to that by which rent was determined before, — that is, by subtracting the total rent from the total product. This

would be a reversal of the method of Table F, and ought to give corresponding results if the land and labor are of the same qualities as were assumed before. Table G is an attempt in this direction, and it is, like Table F, derived from Table E; though it is, for the sake of brevity, confined to the one grade of land represented by farm A.

TABLE G

TOTAL PRODUCT AND MARGINAL PRODUCT OF VARYING NUMBERS OF ACRES WHICH MAY BE CULTIVATED BY FIVE MEN, REPRODUCING THE PROPORTIONS BETWEEN LABOR AND LAND WHICH WERE GIVEN FOR FARM A IN TABLE E.

Number of acres	Total product	Number of acres subtracted each time	Number of bushels subtracted from the product by each decrease of land	Marginal product per acre	Total rent	Total wages	Wages per laborer
500	2500						
250	2250	250	250	1	250	2000	400
166⅔	2000	83⅓	250	3	500	1500	300
125	1750	41⅔	250	6	750	1000	200
100	1500	25	250	10	1000	500	100

Assuming a fixed number of five laborers, this table begins with 500 acres of land of the grade of farm A. This reproduces the proportion between

labor and land with which Table E began. Leaving out of account possible differences in the economy of large-scale production, five men on 500 acres ought to produce five times as much as one man on 100 acres. Accordingly, the product of this larger combination is placed at 2500 bushels. Capital is supposed, as in the former case, to vary with the land, or to be a part of the farm, and it may therefore be left out of account. Changing the amount of land to 250 acres reproduces the proportion between labor and land which we had in the former table when two men cultivated 100 acres (5 : 250 :: 2 : 100), and ought to produce proportionally more, or 2250 bushels (2 : 900 :: 5 : 2250). Since five men on 500 acres produced 2500 bushels, and the same men on 250 acres produced 2250 bushels, the subtraction of 250 acres reduced the product by the amount of 250 bushels. This is the amount which would have to be attributed to the 250 acres, and it would approximately determine the amount which the five men could afford to pay for that amount of land, making a rental of one bushel per acre. Since the land is all of the same grade, and one acre is as good as another, this is the amount per acre which they would pay for the remaining 250 acres. Their total rent will therefore be 250 bushels, leaving a total sum for wages of 2000 bushels, or 400 bushels per man.

Again, by further reducing the number of acres to $166\frac{2}{3}$, we reproduce the proportion between labor and land which we had in the former table when three men worked on 100 acres ($5 : 166\frac{2}{3} :: 3 : 100$). Since three men on 100 acres produced 1200 bushels, five men on $166\frac{2}{3}$ acres ought to produce 2000 bushels ($3 : 1200 :: 5 : 2000$). In this case the further reduction of $83\frac{1}{3}$ in the number of acres would cause a further reduction of 250 in the number of bushels, or three bushels per acre. This is the amount per acre which the five laborers could afford to pay rather than to have their acreage cut down, or to secure a larger acreage after it was cut down. This would also fix for the time the rent of the remaining $166\frac{2}{3}$ acres, making a total rent of 500 bushels, and leaving a total of 1500 bushels for wages, or 300 bushels per man. And so the table proceeds until it ends, as did Tables E and F, with five men on 100 acres producing a total crop of 1500 bushels, each reduction in the number of acres bringing about a reduction in the amount produced. By attributing the reduction in the product in each case to the reduction in the amount of land, we can determine the virtual product of the land (or the marginal product as economists are wont to call it) by what logicians call the "method of difference," and wages by a variety of the "method of agreement." In Table F wages were found by the

"method of difference" and rent by the "method of agreement."[1]

Tables F and G illustrate two methods of determining the share of any factor in distribution. One is to find its marginal product by varying its amount and attributing the resulting variation in the amount of the product to the variation in the factor in question, there being every reason for believing that this will measure the sum which can profitably be paid for that amount of the factor which is added or subtracted. The other is to first find the marginal productivity of the other factors and to determine from this their total earnings. Whatever surplus remains after subtracting the total earnings of the other factors from the total product would then be the share of the factor in question. It has, however, been questioned whether these two methods would give the same result;[2] but a comparison of these two tables, or of any others which fairly represent the law of diminishing returns, ought to effectually dispose of this question, for it will be found that the

[1] Cf. J. S. Mill, "System of Logic," Book III, Ch. VIII.

[2] *E.g.*, Mr. R. S. Padan, in an article entitled "J. B. Clark's Formulæ of Wages and Interest," in the *Journal of Political Economy* for March, 1901, claimed that no such harmony between the two methods had been shown to exist. Professor Clark, however, relied upon diagrams rather than tables, and the harmony is not so demonstrable by that method.

results are exactly the same in either case, whether applied to the determination of one share or the other.

Both tables serve to illustrate explicitly the working of the law of joint demand as applied to land and labor. They show with some degree of definiteness how an increase in the supply of one factor tends, other things equal, to increase the demand for, and the price of, the other factor or factors which coöperate with it in production. The demand for any factor being based upon its marginal product, anything which increases that marginal product will increase the demand for it. This is a law which applies to capital also, as well as to land and labor.

The proposition that rent is due to the productivity of land does not by any means carry with it the proposition that it is due to the productivity of landowners. Their income, consisting as it does of the rent of land, may, and sometimes does, come to them without their having performed any useful function in industry or in society at large. They may, however, and usually do, contribute something useful by which their incomes are increased above the mere rent of their land. They may, for example, cultivate their own land or do some other useful work, such as the management of their estates, or they may expend labor and capital in placing improvements

upon their land, in either of which cases they earn something in addition to the rent of their land, though it may come to them in a form which is indistinguishable from rent. In so far as they are merely receivers of rent, landowners are mere parasites, receiving a share of the product of the industry of others and lending no aid in return, unless permitting their land to be used can be considered as lending aid in the work of production. But inasmuch as they did not create the land, but were permitted to become its owners by the laws of society, they can hardly be regarded as contributing anything to society when they in turn permit their land to be used.

However, the function of the landowner is not necessarily a barren one except when he abuses the power placed in his hands or fails to meet the responsibility which such power places upon him. Those who use land which they do not own are notoriously wasteful of its resources, having a view to their immediate gain rather than the permanent value of the land, and they have to be restrained from ruining the land by the oversight of some one who has a deeper interest, or by stipulations in the contract under which they are allowed to use it. Some one must take the responsibility of guarding against this tendency to exploit the land, and there are but two ways of securing this. One

is for the government to keep control of the land and fix the rules for its utilization, regulating by laws that are somewhat general in character such matters as the rotation of crops and the manuring of the land, in the case of agricultural land, and the work of excavation and building, in the case of city land. The other is to turn the land over to private owners, trusting that their self-interest and their regard for the welfare of their families will prompt them to look out for the preservation of the energies of the soil. On the whole, the latter method has proved to be the more successful, especially in the case of agricultural land. The ownership of land has a wonderfully stimulating effect upon the economic virtues of thrift and foresight. "The magic of property turns sand into gold."

There are other results, some good and some bad, which follow from a system of private property in land, the discussion of which would take us too far into the fields of politics and sociology. It may be mentioned, however, that such a system undoubtedly gives a greater stability to society than could be secured without it, as landowners are a proverbially conservative class. At the same time it gives greater flexibility and adaptability in the management of the land than could be secured

through any governmental machinery which would adequately prevent the wasteful exploitation of the land. Again, it is probable that any country will be more stubbornly defended against foreign invasion by a population made up largely of landowners than by any other kind of a population, though there may be some doubt about this, and it is growing of less importance even if true. Finally, the system of private ownership helps to develop a leisure class which may be a blessing or a curse, according to the way in which it chooses to spend its leisure. It is only necessary to point out that most of the arts and graces of civilization, as well as most of its vices, have grown up because there have been some who had time to think about other things than the earning of their daily bread.

We are for the present concerned primarily with the nature of rent, why it accrues, and the laws by which its amount is determined. As to the first question, we have found that rent is that income which is derived from the ownership of an original and natural agent of production; as to the second, that it accrues because that agent is scarce; and as to the third, that the amount of rent is determined by the joint operation of the productiveness and the scarcity of land, being in each individual case determined by the amount

which the use of the particular piece of land in question adds to the product which could be secured without it, and this amount itself being determined by the amount of land of that grade as compared with all the other factors with which it co-operates in the work of production, — in other words, by the marginal productivity of that grade of land. This is only another way of stating the classic law of rent, viz., that the rent of any given piece of land is what it will produce over and above what could be produced on the poorest land in cultivation by the same amount of labor and capital; for this difference is one way of measuring the amount which the piece of land in question adds to the product of the community over and above what could be produced without it.

It has sometimes been argued that rent does not enter into the price of products, on the ground that if rents were remitted by landlords, the tenants would simply pocket the amounts and make no reduction in the price of their products on their wares. The price of goods being determined by demand and supply, the remission of rents would make no difference in either factor. It would not reduce the number of consumers, nor the strength of their desires, nor the length of their purses on the average. Nor would it increase the amount of land, labor, or capital by

which the supply of products could be increased, nor would it cause any of these factors to work any harder. But this does not constitute a valid distinction between rent and the other shares in distribution for the reason that all that was said about the results, or absence of results, of a remission of rents, could be repeated concerning a remission of wages by the laborers or of interest by the capitalists. In either case the employers would simply pocket their gains and go on selling as before, at whatever the market would stand. The market as a whole would not be affected in this case any more than in the case of the remission of rent, though there would doubtless be a change in the relative values of different commodities because of changes in the purchasing power of different classes of consumers. The remission of wages would not increase the amount of labor to be had, and consequently would not increase the supply of products.

There is, however, a sense in which wages do enter into the price of products and in which rent does not. Laborers have to be persuaded to work by some offer of advantage to themselves, but land does not. It is true that landlords may have to be persuaded, but there would be land if there were no landowners whereas there would be no labor if there were no laborers. Labor is inseparable from

laborers, but land is separable from landowners. Therefore the three following propositions may be laid down respecting labor. 1. In order that there may be production there must be labor. 2. In order that there may be labor there must be wages to persuade men to work, and to enable them to do so, otherwise there will be no labor and no production. 3. Therefore wages are necessary in order to secure the production of goods, — in other words, they are a necessary part of the cost of production. Since the cost of production is an important factor in determining the supply of products, and the supply is one of the factors in determining their price, it is seen that wages have an important and necessary part in the price-making process.

Obviously no such propositions as the second and third can be made respecting rent. It is not necessary that any one should receive rent in order that there may be land, and rent is not therefore necessary in order that there may be production. Rent is wholly a result of production, and not a cause also, whereas wages are a cause as well as a result. They are a cause in the sense that unlike rent they are a means of securing one of the conditions of production, and they are, like rent, a result in the sense that they can be paid only on condition that there is production. Therefore rent is not, as wages are, a

necessary share in the cost of production. Under a system which forbade any one to receive an individual reward for working there would be no work done, or at least only so much as could be done under the form of play; but, under a system which forbade any one to receive an individual reward for the use of land, there would be just as much land as now, barring a few relatively insignificant cases where land is, in a certain sense, "made." Even taking account of such cases, the difference of degree is so great between rent and wages as to make the two cases non-comparable.

A public policy which forbade wages, or appropriated them for public purposes, would be suicidal in that it would at once stop production, whereas a policy which would appropriate rents for public purposes would not be suicidal in the same sense because, if only pure economic rent were taken, leaving untouched all that could be attributed to labor, foresight, or enterprise, it would not affect production at all, though it might conceivably bring other undesirable results. This is, after all, the most important reason for distinguishing rent from other forms of income. A purely academic discussion might safely ignore such distinctions as exist and treat rent as it chose; but however rigidly analytical, or even mathematical, our study of economics may

become, we must not forget that such studies are of value only in so far as they throw light upon some question of public policy. The distinction just mentioned will throw light on certain important questions connected with taxation.

The rent of such lands as are used for pleasure grounds and dwelling sites requires no such elaborate analysis as has been given to that of lands used for purposes of production. The former class does not differ, so far as the laws of value are concerned, from ordinary articles of consumption. They furnish their utilities directly, and the law of marginal utility, as outlined in the first chapter, determines their value. That which is paid for their use is merely the price of the flow of utilities which they furnish to their users, and these utilities decline as they increase in abundance because of the relative satiation of the wants which they gratify. Therefore we may pass such lands by with the remark that they and their utilities come under the ordinary laws of value and price which was applied to other consumers' goods in the first chapter.

The factors which determine the supply of land are comparatively simple, and require no such elaborate explanation as is necessary in the case of both labor and capital. Nature has fixed for any one generation of men the land supply of the earth.

and they can do very little to increase or decrease it. Geological changes which affect the land surface go on so slowly as compared with the fleeting life of man that he is compelled to regard them as non-existent from the standpoint of his present economy. But any given population can make a larger section of the earth's surface available for its own uses. The people may scatter themselves over a wider area, or they may construct transportation systems and lines of communication which will enable them to gather subsistence from a wider area, confining themselves to those occupations which require less space. Both methods, however, are likely to be at the expense of some other population or race, and neither is likely to prove an effective method of increasing the world's supply of land. Again, new methods may be found by which space may be economized in the way of intensive farming and the construction of taller buildings; but these are methods of decreasing the demand for land rather than of increasing its supply. Finally, certain small areas may be reclaimed from the sea, the swamp, or the desert, and these may be regarded as practical additions to the land supply; but these additions are so small as not to affect the market for land to any appreciable extent outside of such countries as Holland. We

may conclude, therefore, that land is a factor whose supply is practically fixed by nature rather than by human effort.

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CHAPTER VI

INTEREST

We now come to the most difficult and elusive problem in distribution, namely, that of the nature and cause of interest, and it is therefore necessary to proceed slowly with our analysis. We may begin by defining interest as the income which capital returns to its owner whether he lends it or employs it himself in his own business. There are three forms in which this income may be returned. In the first place, it may come as payment for the loan of a general fund of wealth. Such a loan usually takes the form of money or some substitute for money, such as a credit instrument. In either case the borrower exchanges the thing which is technically borrowed for the other goods which were the real objects of his borrowing. From his point of view, money fulfils the character which Aristotle ascribed to it, — that of serving merely as a claim upon society for a share of the general fund of wealth in its possession. In the second place, the capitalist's income may be received for the loan

of certain specific pieces of capital such as buildings and machinery; and, in the third place, it may be secured from the use of capital in his own business.

In popular language, only the first form of the capitalist's income is invariably called interest. The second is called either rent or interest, and the third either profits or interest. But since they are all alike in being derived from the ownership of capital, economists have generally chosen to call them all by one name, and have chosen interest as that name, reserving the word "rent" for the income derived from the ownership of land, and profits for an income which has been variously described, but which usually has some connection with the peculiar function of the independent business man himself rather than with that of his land or capital.

But if we are to extend the definition of interest in this way, care must be taken not to include too much. In the case of a loan of money, or of a general fund of capital, only the excess paid back to the lender over and above the amount which was borrowed is called interest. In other words, interest is the amount which the owner receives in excess of the sum necessary to preserve the supply of his capital intact. In the case of a loan of money, this is made perfectly clear by the customs of the market which

name the one part interest and the other part principal. But in the case of a loan of specific forms of capital, and in that of capital which is used by its owner, no such distinction is made. The owner gets his income in an undifferentiated sum, and he must use his own discretion about keeping up repairs or otherwise preserving the supply of his capital from exhaustion. Yet, logically, only the excess of his gross income over and above the amount necessary for that purpose can strictly be called interest. The gross income in such cases resembles somewhat the royalty which is paid for the privilege of working a mine, a part of which is to compensate for the deterioration of the mine through the exhaustion of the mineral, and only the remaining part being rightly called either rent or interest, though, of course, the value of the mine cannot be preserved intact, and the owner must use that which he receives from it by purchasing other productive wealth if he is to preserve the *amount* of his wealth intact.

Since interest exists only when the gross income from capital is more than sufficient to replace it or to keep its supply intact, a complete explanation of the interest problem must therefore answer two distinct questions: first, Why does capital return an income to its owner? and second, Why is this income more than sufficient to keep the supply of capital in-

tact, or to replace it when it is worn out or otherwise passes from the possession of its owner? The latter is the true interest problem, but it cannot possibly be answered without first answering the former. It would not be very inaccurate to say that capital earns two sums for its owner: first, a sum for replacing itself, and second, a further sum as an extra reward for the capitalist. Both sums need to be accounted for, but the second is the one in which the problem of interest finally centres.

First, Why does capital earn an income of any kind for its owner?

That capital is productive has often been questioned, but no one would deny that tools and other materials of production are useful; yet these two propositions mean exactly the same when correctly understood. Capital consists primarily of tools and other materials of production, and such things are useful only in so far as they add something to the product of the community. Find out how much can be produced without any particular tool or machine, and then how much can be produced with it, and in the difference you have the measure of its productiveness. This is also the only measure of its usefulness, since it is useful only in production. Moreover, this is the only way in which the productiveness of labor or any other factor can be determined.

It will be readily understood that this is quite different from saying that the productiveness of labor in general, or of capital in general, can be determined by withdrawing all labor or all capital from industry, and then attributing the diminution in the product entirely to the factor which was withdrawn. As pointed out many times already, the market does not deal with things in general, but with specific units of specific commodities or agents of production. Ignorance of this elementary fact is responsible for a great deal of faulty reasoning in the discussion of some of the problems of distribution. To withdraw all labor from industry would, of course, destroy the whole product. This is made the basis of the claim that labor alone is productive. It is argued that if there were no labor, there would be no product, and that capital is absolutely barren except when directed by labor. If this proves that labor is the creator of the whole product, it can be proved by the same method that land is the creator of the whole product; for if there were no land, there would be no product, nor any labor either for that matter. Similarly, if there were no capital, there would be very little product. Destroy all the tools and other instruments of production, and the product of industry during the next year would be exceedingly small. But no one would claim that the whole amount by

which the product was diminished was the product of capital alone, and that only the small amount which could be produced without any capital was the product of land and labor. Such an opinion would, however, be quite as intelligent as the claim that labor alone is productive.

To be sure, not all capital consists of tools, nor even of instruments of production. Some of it consists of consumers' goods, which are loaned, rented, or hired, and from which the owner derives an income. Nevertheless, the sweeping denial that capital is productive carries with it the denial that tools are aids in production, which would be too absurd to discuss. Rather than attribute such an opinion to any one, we ought to find out, if possible, whether those who deny the productivity of capital do not misapprehend the real nature of capital. It will generally be found that they are not thinking of tools or concrete instruments of production, but of a general fund of value, mistaking the quantitative expression of capital for the capital itself. If they mean that this fund of value does not produce anything, they are quite right, since capital has value solely because it is productive (leaving out of account that small share which consists of consumers' goods). It would therefore be more accurate to

ay that its value is due to its productiveness than hat its productiveness is due to its value. The atter is probably what is meant when it is denied hat capital — meaning its value or amount, as hat amount is popularly expressed — is productive. However, capital is not value but things.

Confining our attention for the present to that part of capital which consists of producers' goods, t is safe to say that its use is wanted only for the ake of what it will add to the income of him who ises it rather than for the sake of any direct atisfaction which it may afford. It is because of his income that the user will sometimes borrow capital and pay a price for its use. And, generally speaking, the owner who uses his own capital prizes it for the sake of the income which it brings him. But an instrument of production adds to the income of him who uses it only by enabling him to produce more than he could without it. The more it will add to his product, the more he wants the use of it, and, consequently, the more its use is worth. The amount which it adds to the product of its owner when he uses it himself is, of course, the amount which it adds to his income; and the amount which it adds to the product of the one who borrows it is approximately the amount which he can afford to pay for its use.

The productivity of capital is, like that of land and labor, subject to the principle of marginal productivity, which is, as we have seen, a part of the general law of diminishing returns. Increase the number of instruments of a given kind in any industrial establishment, leaving everything else in the establishment the same as before, and you will probably increase the total product of the establishment somewhat, but you will not increase the product as much as you have the instruments in question. Introduce a few more looms into a cotton factory without increasing the labor or the other forms of machinery, and you will add a certain small amount to the total output. There will be a few of the workmen who can tend more than the normal number of looms and turn out a fraction more work than with the regular number. But they will not be able to make *each loom* turn out as much work as before. The problem of the manager is to apportion the men and the looms in that ratio which will turn out the largest product in proportion to the total cost; and he is therefore not intent on getting either the maximum per man or the maximum per loom. If he were intent upon the former, he would use many more looms than at present, and in the latter case he would put one man in charge of each loom in

order to run it at its maximum speed with as few stops as possible. One man with two looms would turn out more per man, but slightly less per loom, because there would be a few more stops. One man with four looms would turn out still more per man, but still less per loom, and so on. This means that the marginal product of looms, or the amount which each loom would add to the total product of the combination, diminishes as looms increase in comparison with labor and other factors of production. That which is true of looms in this particular is also true of ploughs on a farm, of locomotives on a railway, of floor space in a store, and of every other form of capital used in industry.

All this is as true of the community as a whole as it is of a single establishment. If, for example, there are very few ploughs in a given community where there is an abundance of land, labor, and other capital, each plough would be a matter of considerable importance. Each one would have to be used intensively, and the withdrawal of one, or the making of another, would make a considerable difference in the amount of certain things which the community would be able to produce. But with a larger number of ploughs, other factors remaining the same, each one would be used less intensively, and the loss

of one or the addition of another would make less difference in the product of the community.

This principle may be broadened so as to include all capital in the same class. An increase in the total amount of capital may be conceived as coming about through the proportional increase of all the various forms of capital at the same time. In fact, this is the way in which it would normally come about in the absence of inventions of new kinds of capital or of new uses for the old kinds. If the capital-making process, which will be explained later, increases without any new inventions to give it new directions in which to increase, it is to be expected that all the existing forms of capital would increase in something like the same proportion. Then if labor and land were to remain the same, or to increase less rapidly than capital, such an increase of capital would reduce the marginal productivity of each and every form of capital. There would be less land upon which to use each tool, and less labor to use it. The marginal productivity of ploughs in the previous illustration would diminish when there were more ploughs in proportion to the labor and land, even though the number of other instruments of production increased proportionally with the ploughs. The same would be true of every other form of capital, and, consequently, the proposition is established that

the marginal productivity of capital in general decreases as the amount of capital increases relatively to land and labor.

The working of the law of marginal productivity as applied to capital might be illustrated by means of tables similar to Tables E, F, and G in the previous chapters; but the whole matter ought to be clear enough by this time. The following diagram will,

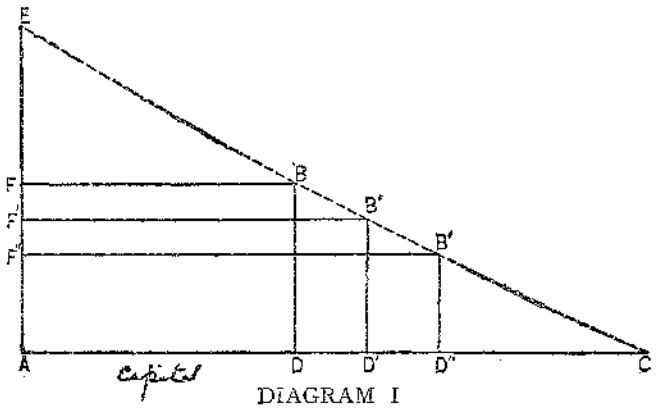


DIAGRAM I

however, serve both as an illustration of this law and as a means of introducing the next question to be considered in the general problem of interest.

Let the amount of capital in the industrial community be measured along the horizontal line AC, and let the productivity of capital be measured along the perpendicular line AE, and let the descending line EC represent the rate of decrease in the

marginal productivity of capital. If the amount of capital were measured by AD, the marginal productivity would be measured by the line BD or AF. If the amount of capital were measured by AD', the marginal productivity would, other things remaining equal, be measured by the line $B'D'$ or AF'; and when the amount of capital equalled AD'', marginal productivity would equal $B''D''$ or AF''. From this it follows inevitably that, if capital went on increasing to AC, the marginal productivity of capital would be destroyed altogether. That is to say, the supply of capital would have reached that limit where no more could be used to advantage, and some could be spared without loss.

It begins to appear that any explanation of the problem of interest must account for the supply of capital as well as for its demand. The latter is accounted for by the law of marginal productivity; but, unless the supply is in some way limited, the marginal productivity of capital will disappear. What limits the supply of capital? It is not limited by nature beyond the power of man to increase or diminish, as is practically true in the case of land. It is a product of human effort and can therefore be increased, within pretty wide limits, at will. Were there no sacrifice connected with the production of capital, and with the maintenance and increase of its

supply, would it not increase indefinitely until its marginal productivity would be reduced to the vanishing point? The income from capital in the shape of its contribution to the product of the community is an undoubted advantage. Were there no compensating disadvantage, men would pursue this advantage by increasing the supply of capital until the advantage would disappear. The value or price of an ordinary commodity is an advantage to the producers of it, but they incline to pursue this advantage by increasing their production until the advantage is about counterbalanced by a disadvantage in the way of cost of production. What is the corresponding disadvantage which checks the production of capital?

This disadvantage is of two kinds. In the first place, there is the cost of making the tools and other materials of which capital consists. Each tool must, on the average, earn at least enough during its lifetime to pay the cost of making it; otherwise tools would not be made. In more general terms, the marginal productivity of capital must be such that each and every form will, on the average, earn as much, or, which means the same thing, add as much to the product of the community during its lifetime, as it cost to produce it. Otherwise the production of capital would be checked, its supply

diminished, and its marginal productivity consequently increased. Again, if this were the only disadvantage, the supply of capital would normally increase up to that point where its earnings or its marginal productivity would, during its lifetime, just cover its cost.

This may be illustrated by the following diagram which is an elaboration of Diagram I on page 223 of the present chapter.

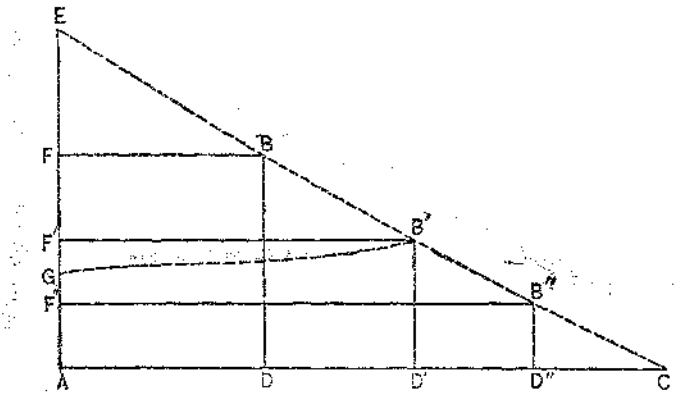


DIAGRAM II

Let us suppose, as in the former diagram, that the number of implements of a certain kind, say ploughs, is measured along the line *AC*, and their marginal productivity along the line *AE*. In this case, however, we mean their total marginal product during their average lifetime, or that amount which an

average plough will add to the product of the community during its lifetime, over and above what could be produced without it. To distinguish this from the marginal product per year, we shall call it the total earnings of a plough. Letting the descending curve represent the decline in the total earnings of each plough as the number of ploughs increases, the line DB or AF would represent the total earnings of each plough when their number was represented by the line AD. When their number is AD', the total earnings of each would be $D'E'$, or AF', and when the number is AD'', the total earnings of each would be $D''B''$ or AF''. Let us further suppose that the cost of making ploughs is represented by the perpendicular distance of the various points on the ascending curve GB' above the base line AC, as was done in the diagram on page 37 of the chapter on Value. If this cost were the only check on the production of ploughs, there is no reason why they should not increase to the point D', where the total earnings of each plough would just pay the cost of making the most expensive part of the total supply. They would sell at the uniform price of $D'E'$ or AF', which would be their normal equilibrium price.[1] The total earnings of a plough would then just cover the price which the buyer would have to give for it.

[1] See Chapter I, p. 31.

But if a piece of capital should earn during its lifetime only enough to pay the cost of making it, or the price which its owner would have to pay for it, there would be no such thing as interest. That would only be enough to replace it when it was worn out and to keep the supply intact. The owner who used capital under such circumstances would gain nothing by its use, and a borrower would lose if he paid back more than the principal of a general fund borrowed. As we have already seen, interest exists only when capital earns something in addition to that which is necessary to replace it and maintain its supply intact. It is evident therefore that some additional check must be put upon the production of capital if it is to yield any interest, for if the cost of making it were the only check, its supply would normally increase until its earning capacity would fall to a level with its cost of production. But if, in the former diagram, the supply of ploughs could be checked at the point *D*, so that the earnings of each plough would equal the line *DB*, each plough would then earn something for its owner over and above the cost of making it, or the price which its owner would have to pay for it. What is there to further check the production of ploughs, or of other forms of capital, so that they may earn such a surplus?

Such a check is found in the conjunction of two facts: first, the owner of capital must wait for its earnings to come in; second, as a rule, men do not like to wait. Take the case of a blacksmith who, by his own labor, makes a plough out of materials which cost him $5. Let us suppose that he can in a fortnight make a plough which will earn a total of $30 during its lifetime of ten years. Deducting the cost of materials, this leaves him $25 as the net earnings of his fortnight's work; but he must wait for his wages, receiving them in instalments over a period of ten years. If he does not mind waiting, this will be no drawback and he would just as lief make a plough as to work for the same amount in cash or in present consumable goods. Or, having made such a plough, he would not sell it for less than $30, the total amount which it will be expected, one with another, to earn during its lifetime.

But if he does mind waiting, and would much prefer to receive his wages at once, he would not make ploughs at all so long as he could earn $25 per fortnight in present consumable goods. Or, having made a plough which will earn $30 in the course of its lifetime, he would be willing to sell it for less than that amount, which, counting out the cost of the raw materials, would net him less than $25 for his work. If no blacksmith could be found willing either to

wait ten years for his wages or to accept less than $25 for the amount of work necessary to make a plough, no ploughs with such small earning capacity would be made unless some one else could be found who did not mind waiting and who would therefore be willing to pay $30 for a plough and then wait ten years to get his money back. But if no such person could be found, the making of ploughs would stop until their growing scarcity would raise their marginal productivity and their total earnings somewhat above $30.

Though no one would be likely to want to wait ten years to get back the same amount of money which he spent on a plough, he might be willing to wait for that amount plus a surplus. That is, he might be willing to pay the blacksmith $30 for a plough which would, in the course of ten years, earn the total amount of $50. In that case, he would get back his original outlay and $20 besides. The $20 would be interest. Under these conditions it would be the general dislike of waiting which would so limit the production of ploughs that each one would, on the average, earn more during its lifetime than was sufficient to pay the cost of making it. But if the dislike of waiting were general, it would limit the supply of other kinds of capital as well as that of ploughs, and it would therefore be a general cause of

the existence of the surplus which we have called interest.

All income-bearing goods are, as we have seen already, alike in that they are not wanted for their own sakes, but for the sake of the incomes which they will earn. Incomes consist, in last analysis, of consumers' goods,[1] and these goods are the sole reason for desiring the possession of income-bearing goods. But all forms of capital are alike in that their cost of production must have been borne by some one before they begin to return their incomes. The maker of a piece of capital must himself wait for the income to mature, or he must sell it to some one else, in which case it is the buyer who waits. His waiting consists in giving up the opportunity of buying present consumers' goods, and receiving in return the means of securing consumers' goods at some time in the future. It is virtually an exchange of present consumers' goods for future consumers' goods. While technically he receives present income-bearing goods, yet since he does not want them except for the sake of the want-satisfying consumers' goods which they will bring him, he really exchanges for the latter goods. It is the same whether he lends money, or invests in machinery, or deposits in a savings bank. They are all forms of waiting, or of

[1] Cf. Taussig, "Wages and Capital," Chapter II.

saving as it is sometimes called. The man who buys a plough to use on his farm is saving as truly as the man who deposits a like sum in a bank or hides it in his stocking. Waiting or saving is quite as essential to the existence of capital as labor itself, for if there were no saving there would be no capital. Since men as a rule do not like to wait any better than they like to work, it is quite as essential that waiting be paid for as it is that work be paid for.

But it must not be inferred that all saving involves sacrifice. There would be some saving were there no interest at all, — that is, if capital did not earn any more than enough to replace itself. It is even probable that a considerable amount would be saved if, instead of savings affording a surplus, men were obliged to pay rent for vaults in which to store them or even to hire others to take their surplus wealth and use it for them. In so far as it is true that men estimate present higher than future consumption, it only applies to the consumption of corresponding increments of income. A man with an income of $10,000 a year derives less utility from the consumption of the last than from the first thousand. He may receive so small an amount of pleasure from the consumption of the last thousand dollars that he will prefer to save it for the purpose of satisfying a more pressing want in the future. It is upon this princi-

ple that men lay up for a rainy day or for old age. This may be illustrated by Diagram III below.

In Figures I and II of that diagram, let the amount of a man's income be measured along the horizontal lines AB and $A'B'$. Let the utility of different increments be represented by the perpendicular lines, those in Figure I representing the present utility of present increments of goods, while those in Figure II represent the estimate which we

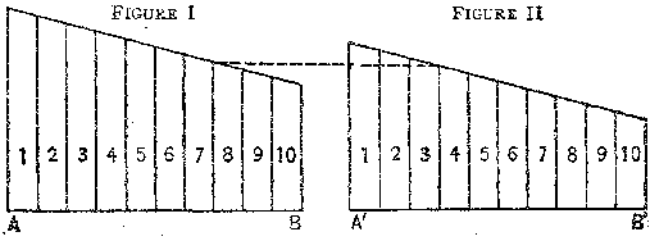


DIAGRAM III

now put upon the utility of the same or equivalent increments of goods a year hence. In other words, we discount the future at a rate corresponding to the ratio between the perpendicular lines in Figure I and the corresponding lines in Figure II. It is evident, then, from the diagram, that increment No. 10 would be saved, in order that it might be applied to the satisfaction of want No. 1 in the future. Similarly, No. 9 of the present would be saved because No. 2 of the future is higher. The same may be

said of No. 8 of the present, because it does not quite come up to No. 3 of the future. But here saving would stop; for there would be a loss in abstaining from the consumption of No. 7, in order to apply it to No. 4 in the future.

This diagram, it will be understood, only illustrates a certain social tendency. In a less advanced stage of society than that to which we are accustomed, the difference between the estimations of present and future would be greater than under present conditions. Even in present society there are those to whom the future seems to offer small inducement for present frugality. On the other hand, there are those in whom the instinct of saving is so strong that they seem to begrudge themselves present satisfaction, — and that, too, without much thought of future consumption, but simply to gratify their desire for accumulation. But the normal tendency is probably illustrated by the man who looks forward to the time when he will have greater wants to supply on account of a growing family, or the hope of some time having a growing family to provide for, and who also looks forward to the time when age will begin to tell upon his powers, and the same income will have a larger marginal utility, owing to the increased pain of producing it. Neither in the case of this man, nor in that of the miser, is there any true sacrifice

connected with saving. His capital costs him nothing except the original outlay to pay the cost of production. Were there no other way of saving, such a man would buy a plough and pay for it all that it would ever earn for him, in which case he would only get his principal back, and no interest at all.

If only so much were needed to carry on industry as could be saved without any sacrifice, — that is, if so much were sufficient to bring down the marginal productivity to the point where it would just pay the cost of making it, there would be no interest anywhere. But, if more is needed, — that is, if more can be used and still afford a surplus at the margin, it must be paid for, because to save it requires sacrifice from somebody. Returning to our illustration, if increment No. 7 is required, it will be saved at a loss, because its present utility stands higher than our present estimate of the utility of No. 4 in the future.

In this connection appears a possible correction to Böhm-Bawerk's theory, according to which interest must equal the amount by which men discount the future, or the difference between the value of present and of future goods. The statement that "present goods are, *as a rule*, worth more than future goods of like kind and number," [1] would carry with it the statement that a dollar now is worth more in

[1] "Positive Theory of Capital" [Smart's translation], p. 237.

present estimation than a dollar a year hence. If we elimate the element of risk, as he expressly states that we must do, it can scarcely be said to be true that, *as a rule*, a dollar is worth more to-day than a year hence.

Of the wealth in the possession of society to-day it is altogether probable that the greater part would be saved for more than a year, even if there were no surplus to be secured by so doing, — that is, if men knew that they would only get their principal back. In other words, so far as concrete goods are concerned, their future value is sometimes greater than their present, because they are expected to supply a more pressing want in the future than it is possible to apply them to in the present. In such cases there is a high reward for saving in the anticipated future increase in their want-satisfying power. This class of goods may be called the first increment of capital saved. It is that portion which would be saved even if its owners should be compelled to hire vaults in which to store it. The second increment may have a lower anticipated future increase of want-satisfying power than the first; but its future utility may still be estimated just as highly as its present utility, while the saving of the third involves a positive sacrifice, because its future want-satisfying power is estimated as lower than its present, and that of the

fourth still lower. In this case the decrease of subjective utility must be compensated for by a surplus. It is not the difference in the general estimation of present and future goods which fixes the rate of interest, but only the difference in the estimation of the present and future value of the last increment of goods saved.

If in Diagram IV we let the angle of descent of the line AC''' represent the rate at which, according to Böhm-Bawerk, men discount the future, and let the line AB represent the present value of a commodity, the line CB' would represent the present value of the means of securing it a year hence, $C'B''$ the present value of the means of securing it two years hence, and so on. According to this theory, one year's interest ought to equal the dotted line $A'C$, two years' interest the dotted line $A''C$, and so on.

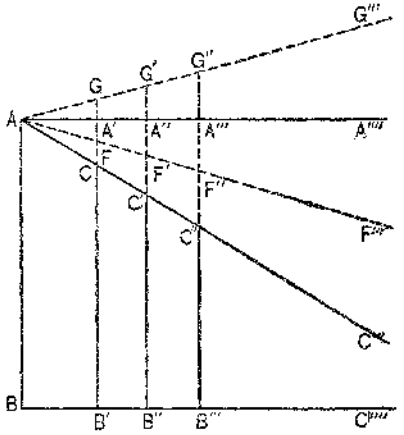


DIAGRAM IV

In the first place, as suggested above, it is not

correct to speak of a general discounting of the future use of commodities, or concrete goods. In a great many cases the future use of a commodity is estimated higher than its present use, because present wants are so well supplied that the marginal utility of present consumption is very low. Suppose, for example, that you have $100 in your pocket. You can spend it all to-day on your dinner; and you might, could you forget the future, get some satisfaction out of the consumption of the last dollar. But you do not forget the future; and the amount of pleasure which you could get out of the expenditure of the last ninety-nine dollars is so small that you prefer to save it, in order that you may enjoy a series of ordinary dinners in the future. You would save it were there no interest to be had. In fact, if you could not keep it yourself, you would hire some one to keep it for you rather than consume it now. Yet, if you choose to lend it, you can get just as much interest for it as though it had cost you a heavy sacrifice to abstain from consuming it.

Nevertheless, you doubtless have a more vivid appreciation of present than of future wants. There is a point at which you will stop saving, because you do not expect ever to be in a position when an ordinary dinner will be worth more to you

than it is now. You will probably not forego the pleasure of a fifty-cent dinner and content yourself with a fifteen-cent lunch, in order to be better provided in the future, because you never expect to be in a position when you cannot afford a fifty-cent dinner. Were you a spendthrift, you would probably not hesitate to spend several dollars on expensive delicacies and fine cigars for the same reason. The spendthrift's appreciation of the future is very low. Your case may be taken as typical of society as a whole. There is a certain point where, were there no interest or profits from the use of capital, saving would cease. That point would be where men balanced present against future consumption; in other words, where the want-satisfying power of present and of future goods is equal in present estimation. But if the use and employment of capital is productive, and the amount of capital in existence under these conditions were not enough to bring its marginal productivity down to the point where it would just pay the cost of making it, there would be a demand for more capital. In order to get it, interest in the form of a surplus would have to be paid to induce men to save more. Consequently, interest does not correspond to any general discounting of future consumption of commodities, but only to the marginal discount or to the mar-

ginal sacrifice of saving. It must be sufficient to compensate the capitalist for saving the last increment of capital.

This also may be illustrated by Diagram IV, page 237. Of the first increment of goods saved, let the present value be represented by the line AB. The present estimate of its value a year hence by GB', two years hence by $G'B''$, etc. Of the second increment, the present value is AB. The present estimate of its value a year hence is represented by $A'B'$, two years hence by $A''B''$, etc. Of the third increment saved, the present value is represented by AB, the present estimate of its value a year hence by FB', two years hence by $F'B''$, etc. Were this the last increment saved, one year's interest for all increments would correspond to $A'F$, two years' interest to $A''F'$, etc. But the fourth increment has a present value corresponding to AB, and an estimated value one year hence corresponding to CB', two years hence corresponding to $C'B''$, etc. Since this is the last increment saved, one year's interest throughout the field would correspond to $A'C$, two years' interest to $A''C'$, etc. The loss in the subjective valuation of this last increment must be compensated for by a surplus in the form of interest. But if some capital yields such a surplus over and above the cost of making it, all must do the same. If one plough which

will yield $50 in its lifetime, must be sold for $30 to the marginal buyer, other ploughs of the same kind must sell at the same price, yielding a uniform surplus of $20 a piece. And other forms of capital would have to yield, barring risk, the same surplus in the same time, else all capitalists would be buying those which yield the largest.

If, however, it is intended to apply Böhm-Bawerk's theory to the difference with which we estimate present and future wants (as illustrated in Figures I and II of Diagram III, page 233), it is again found to be faulty. Men seldom abstain from the satisfaction of a want in order to be able at some future time to supply the same or a corresponding want.

In the case of those wants which we leave unsatisfied for the express purpose of getting interest, the interest does not pay for the difference with which we estimate the present and future satisfaction of the particular want which is forestalled. Let us return to Diagram III. If increment No. 7 were saved, the sacrifice would not correspond to the difference between No. 7 of Figure I and No. 7 of Figure II, but to the difference between No. 7 of Figure I and No. 4 of Figure II. If in Diagram IV we let the descending line AC''' represent the rate at which we discount future wants, the rate of interest would correspond to those portions of the perpen-

dicular lines which lie above some such descending line as AF''' rather than to those portions which lie above AC'''.

As already stated, a considerable portion of the capital has involved no sacrifice in the act of saving. Were this supply sufficient to bring the marginal utility down to where it would just balance whatever risk the capitalist undergoes in lending or employing his capital, plus, of course, the cost of making it, no true interest would be paid. A larger amount of saving would cut into more pressing wants, and involve a sacrifice. Men will not undergo this sacrifice unless they are paid for it. This gives rise to interest, which then becomes an element in the cost of capital in addition to the cost of producing it.

The relation of abstinence to interest may be further illustrated by means of the following diagram, which is an elaboration of Diagram II on page 226 of the present chapter. In this case, as in the former, let us assume that the amount of a certain kind of capital is measured along the line AC, and its marginal productivity along the line AE, the descending curve EC representing the decline in the marginal productivity as the supply increases. If there were nothing to check its production but the cost of producing it, the supply would normally increase to the point D', as shown in the former

diagram, at which point the marginal product would just cover the marginal cost, and there would be no interest. This point is located by the intersection of the cost curve GB' with the productivity curve EC. But in addition to the cost of production there is the disadvantage or sacrifice of waiting. The effect of this is illustrated by the rising curve

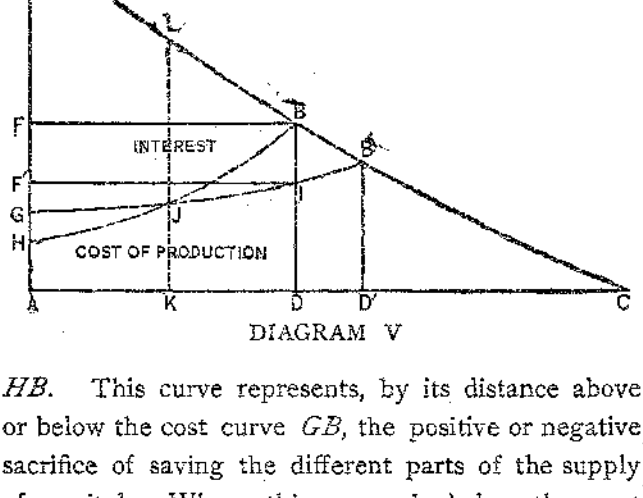


DIAGRAM V

HB. This curve represents, by its distance above or below the cost curve GB, the positive or negative sacrifice of saving the different parts of the supply of capital. Where this curve is below the cost curve, it means that there is an advantage rather than a disadvantage connected with the exchange of present for future goods which saving implies. Where this curve coincides with the cost curve,

there is neither advantage nor disadvantage connected with saving, but when it rises above the cost curve there is a disadvantage connected with saving which becomes a check upon the production of capital in addition to that effected by the cost of producing it.

If the production of capital should stop at the point *K* where, as shown by the intersection of the abstinence curve *HB* with the cost curve *GB'*, there is neither advantage nor disadvantage connected with saving, its marginal productivity would be represented by the line *KL*. This would give its owner an advantage far in excess of any disadvantage connected with its production, and this would stimulate its further production. But in order to increase its production, it would be necessary to do more waiting as well as more work. From this point on, further waiting begins to be burdensome, acting as a positive check upon production. The normal tendency would be for capital to increase up to the point *D*, at which point the combined disadvantage of working and waiting, or of cost of production and abstinence, would be just compensated by the marginal productivity of that kind of capital. At this point the marginal productivity would be represented by the line *DB*, the marginal cost of production by the line *DI*, and the marginal

abstinence by the line *IB*. The total present value of that kind of capital would then be represented by the parallelogram *ADF'I*. The total product of the present supply of capital during its lifetime would be represented by the parallelogram *ADFB*, and the total surplus or interest by the parallelogram *F'IFB*.

The same result is reached by approaching the subject from the side of demand, and regarding the disadvantage of waiting as reducing the purchaser's demand[1] for capital instead of checking its supply. It is, generally speaking, the amount which purchasers will pay for it which constitutes the reward of the makers of capital and serves as an inducement to continue the work of production. So long as the purchaser's demand will give ploughs, for example, a price equal to the cost of producing them, the producers will continue their work. As already pointed out, if there were no disadvantage connected with saving, men might be expected to pay as much in cash for a piece of capital as they expect it to return them in the way of income during its lifetime. In that case the purchaser's demand curve for capital would coincide with the productivity curve of the foregoing diagram. There would then be an equilibrium of supply and demand at the point where the demand-productivity curve *EC* intersects the

[1] As distinguished from the borrower's demand.

cost curve GB'. But since there is a certain disadvantage connected with saving, and men are not always willing — not even those who inveigh against interest on capital — to pay as much in cash, or present consumable goods, for a piece of capital as it will produce during its lifetime, the purchaser's demand

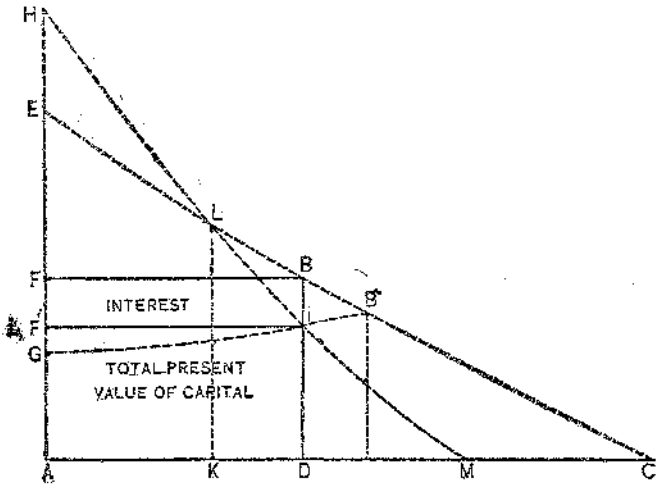


DIAGRAM VI

curve does not coincide with the productivity curve, and the equilibrium of demand and supply is reached at some other point.

This way of approaching the problem may be illustrated by means of the above diagram, which is a modification of Diagram V. The purchaser's demand for capital is, in this case, represented by

the descending curve *HM*, which bears the same relation to the productivity curve *EC* which the abstinence curve *HB* bore to the cost curve *GB'* in the last diagram. Where this demand curve is above the productivity curve, it means that men are so anxious to provide against the uncertainties of the future that they will give a larger number of present goods for the sake of having a smaller number at some time in the future, or that men of enormously large incomes would have so much trouble trying to consume them all that they would rather invest a part in some enterprise for the sport of carrying it through, even though they may never get all their money back, while men of moderate incomes would rather provide against a rainy day than to consume all their incomes, even though their savings shrunk in the interval. Yet if the enterprises return a surplus, and the savings expand, both classes of savers will take advantage of the possibility of getting an increase. Where the demand curve coincides with the productivity curve, it means that there is neither advantage nor disadvantage connected with saving; and where the demand curve falls below the productivity curve, it means that there is a disadvantage connected with saving, and therefore less will be paid for a piece of capital than it will earn in the future.

Under these conditions the equilibrium of demand and supply, which determines the present selling value of capital, would be reached when the supply of capital was represented by the line *AD*, for this would be the point where the purchaser's demand for the different forms of capital would give them a value just equal to their marginal cost of production. Yet the marginal productivity of that amount of capital would be represented by the line *DB*; the present selling value of capital, which is equivalent to the present value of its future product, would be represented by the line *DI*; and the surplus which would come to the buyer who took it at its present selling value and waited for its earnings to mature would be represented by the line *IB*. The total present value of all now existing capital would be represented by the parallelogram *ADF'I*; its total future earnings, computed on the basis of its marginal productivity, by the parallelogram *ADFB*, and total interest or surplus which would come to those who buy the capital at its present value and wait for its product to mature would be represented by the parallelogram *F'IFB*. The annual interest would have to be computed by dividing this gross amount by the average lifetime of the now existing capital. This would give the lump sum going as interest to the owners of capital each year. The annual *rate* of

interest would have to be computed by finding what percentage the annual interest is of the total present value of the capital.

Land seems to yield interest in the same way, especially when looked at from the standpoint of the individual buyer. The demand for land, like the demand for capital, is limited by the fact that the buyer must wait for his returns through a series of years. Consequently, no one will pay a price for it which will at all approximate the total amount of its future earnings. Since land, irrespective of improvements, is practically indestructible, the sum total of its future earnings is practically unlimited. But in order to realize such a return it would be necessary to wait for a longer period of time than the ordinary mortal cares even to take into consideration. A sum equal to its net earnings for a period of thirty years is considered a good price for land, even in the most thrifty communities. All that it earns in excess of that amount may therefore be considered as the interest on the investment. But after such a piece of land has been in the same family for a few generations, all its earnings may be considered as a surplus, since the original investment would have been wiped out.

The owner of capital, as we have seen, must always deduct a certain part of its earnings for the purpose

of replacing it, and only the surplus is interest; but there is an indestructible element in land which does not have to be replaced because it never wears out. Looked at broadly, all the income from this indestructible element is surplus. He who first appropriated it got it for nothing. If it ever returns him an income (and it does not always, some land owing its whole value to its improvements and artificial fertilization), that income is not reduced by the necessity of getting back the original cost. Even the buyer who pays a price for it is under no necessity of deducting anything from its earnings in order to replace it or to prevent its deterioration. The original price which he paid for it may be regarded as being maintained in the land itself. To be sure, even this indestructible element in the land may decline in value because of general social changes; but such a decline, like a rise in value for similar reasons, is independent of any labor or expense which the owner himself bears or shirks; it is not to be attributed to his failure to keep up repairs. Since, in the modern world, the chances of a rise in value are rather better than the chances of a fall, we are well within the bounds of safety when we say that the average piece of land maintains the purchase price of the indestructible element in it without expense to the buyer. He can keep it for a period of years and then sell it for

the former price, meanwhile having received an income from it. In such a case, the whole of the income is a surplus. But since there is no such indestructible element in any form of capital, the whole of the earnings of capital is never a surplus. Therefore, though the rent of land resembles interest in certain points, the differences are sufficient, especially when we consider city land, whose value lies primarily in its indestructible elements of space, support, and location, to warrant our treatment of rent in a class by itself.

Different forms of capital differ greatly as to the length of time they will last. Some, like the coal in the furnace or the ice in the refrigerator, last only a few minutes or hours at most; others, such as buildings and drainage systems, last so long as to almost resemble land in point of durability. But they are all alike in being perishable sooner or later, and in having to produce enough in their lifetime, however brief, to more than replace themselves if their owners are to derive any income from them. The ton of coal, during the brief period when it is burning under the boiler, must add enough to the product of the community to buy another ton of coal and leave something over, or else its destruction does not pay. The product of a piece of capital, however evanescent its form, is determined by the principle of marginal

productivity, though in explaining that principle the illustrations were all drawn from the more durable forms of capital. That is, the more tons of coal there are to be used in any community in comparison with all the other factors, the less each one will be able to add, during its brief lifetime, to the total product of the community. This applies also to such fugitive forms of capital as materials of production which are entering the factories or stores on one day as raw materials, and seeking customers as finished products the next. Each one is a means of adding something to the net income of its temporary owner during that more or less brief period when it is in the position of raw or partly finished goods, — in other words, while it is still capital. Each one is normally expected to sell for a price which will cover its original cost, or replace it with another one like it, besides the cost of working on it, and in addition something extra for the waiting which must transpire between the time of its purchase as raw material and its sale as finished product.

All forms of capital, however durable or evanescent, are alike also in the particular that they require waiting during a longer or shorter period. The coal which is quickly consumed had to be produced first, and some one must carry that cost of production. It may be the miner who mines it, the mine operator

who pays the miner his wages, or the manufacturer who buys it of the mine operator, or it may be all three together; but usually the manufacturer who uses the coal will have paid for a supply in advance of its actual consumption, in which case he will have to wait for its product. Between the waiting for the product of the coal and that of the building in which it is used there is only a difference of degree. As the building is expected normally to earn enough during its lifetime of a hundred years to pay for another building, besides a surplus fund to compensate for waiting, so the coal is normally expected to earn enough during its shorter lifetime to pay for an equal amount of coal, besides a small surplus to compensate for a short waiting period. But if we consider a series of tons of coal, there may be a considerable amount of waiting in the aggregate. However, that part of the manufacturer's capital which consists of coal amounts only to the quantity on hand at any one time. If we may assume that he burns only one ton a day for three hundred days in the year, and that he buys each day's supply only one day ahead, his total capital in the form of coal does not equal three hundred tons, but one ton. If, at the end of the year, each ton has earned enough on the average to replace itself and a fraction over, so that he finds himself at the end of the year with

one ton on hand, as he had in the beginning, with ten per cent of the value of one ton of coal in addition, he may consider that his capital has earned ten per cent interest. And all that has been said of coal is true also of any other form of capital.

It is hardly necessary to state that anything which increases the spirit of thrift, frugality, and foresight, will reduce the marginal sacrifice of abstinence, and correspondingly increase the supply of capital and reduce the rate of interest. It is even conceivable that the desire to save and provide for the future might increase to such an extent as to eliminate interest altogether. This could happen if capital should increase to that point where its marginal productivity would just equal its marginal cost of production. If people were so anxious to save and provide for the future as to offer such prices for the different forms of capital that their total earnings would just cover the price paid, there would be no interest. This could take place without their ceasing to discount the future in the sense in which Böhm-Bawerk uses that expression. Referring again to Diagram III on page 233 of the present chapter, if the difference between our present appreciation of our present and our future wants should grow so small that each one would save the last five sections of his income instead of the last three, as repre-

sented in the diagram, it would greatly increase the amount that would be saved without the necessity of interest as an inducement. In Diagram V on page 243, this increase in saving would be shown by moving the point of intersection of the cost curve and the abstinence curve further to the right. It might conceivably move it as far to the right as the point B', where the cost curve intersects the productivity curve. In that case there would be no such thing as interest, though there would still be the fact that men appreciate the present more highly than the future. However, all this is mere speculation, for such a condition of affairs is not likely to occur.

The risk of losing even one's principal is a powerful discourager of saving. However much men may prefer present to future gratifications when both are relatively certain, there can be no doubt that they still more prefer present certain gratifications to future uncertain ones. And it is a difficult matter to determine how much of the sacrifice of saving is due to this uncertainty. Economic writers generally have excluded the payment for risk from interest, though some have distinguished net from gross interest by defining the latter as including payment for risk and the former as excluding it. But they usually have in mind only the more concrete and measurable forms of risk, such as those resulting from

fire and flood and fluctuations in the market, leaving out of account such non-measurable forms as the chance that the saver may not live to enjoy his savings, or that if he does he may be so well off financially in the future that his savings would not then be needed so much as in the present. It does not seem possible to eliminate risks of the latter type from the normal sacrifice of saving, and therefore, in so far as they discourage the accumulation of capital, they may be said to add to the rate of interest. But the more concrete and calculable forms of risk, such as were mentioned above, are discouragers of enterprise rather than of saving, and are therefore a source of profits, as will be seen in the following chapter.

If the foregoing argument is correct, it would seem that the productivity and the sacrifice theories of interest are to be harmonized in much the same manner as the cost and utility theories of value. This balancing of opposing forces which has been developed by recent writers in their discussions of value seems capable of a much wider application than it has yet received. This chapter is an attempt to apply it to the theory of interest, as the last two chapters have been to apply it to the theories of wages and rent.

The question as to whether or not one man ought to be allowed by law to receive interest from another

resolves itself, as most other political questions, into the simple question of expediency. Without considering the question from the standpoint of abstract ethics, the argument from expediency is sufficient to justify interest. Were it possible to prohibit it, there would be at least two unfortunate results. First, much of the capital would be under inferior management. The reason A hires capital of B is because he can make better use of it than B can. He can make it produce more. If therefore B were forbidden to receive payment for the use of his capital, either society would lose through his inferior management or he would consume it. This brings us to the second unfortunate result. It would decrease the amount of saving. Capital to assist in carrying on industry would become scarcer, and society would suffer from a diminished supply of goods with a corresponding advance in cost. Again, if the owner of capital can secure an income from its use, there does not seem to be any good reason why he should not receive a like advantage if he is asked to lend it.

Whether the owner of capital should be allowed to derive an income from its use is a slightly more difficult problem, but it also must be determined on grounds of social expediency. Aside from the fact that any attempt to prevent it would be abortive, there is the further fact that even if such an attempt

could succeed, it would promptly check the tendency to save. The supply of capital would then be limited to that amount which men would be willing to save without any inducement in the way of a future surplus to compensate for the present disadvantage of saving or waiting. Referring again to Diagrams V and VI, pages 243 and 246, the supply of capital would be represented by the line AK if the owners of capital were not allowed to derive any interest from it. Even those who object to the interest on capital will not pay for a piece of capital all that it will earn in its lifetime, and not to pay that much is to receive interest on it. Paying less for it than its total earnings during its lifetime, and then waiting for those total earnings to mature, puts them in possession of a surplus, and this is taking interest as truly as when one man lends money to another for a stipulated rate of interest. The income of the wealthy capitalist who owns factories or railroads is of the same sort and derived from the same source, though on a larger scale, provided, of course, he has not secured a monopoly or otherwise swindled the public.

COLLATERAL READING

E. Böhm-Bawerk, Positive Theory of Capital, Books V–VII.

Alfred Marshall, Principles of Economics, Book VI, Chapter VI.

J. B. Clark, The Distribution of Wealth, Chapter XIII.

CHAPTER VII

PROFITS

THOUGH broadly defined as the income of the business man who receives neither stipulated wages, rent, nor interest, the meaning of the term "profits" has been narrowed down by the enlargement of the definitions of the three other shares. If wages are the earnings of all labor, they must, of course, include the earnings of the independent worker, whether he runs a small shop where he works alone, or a large establishment where hundreds are working for stipulated wages under him. Similarly, if rent is the earnings of land, it must include the earnings of the business man's own land, and for the same reason interest must include the earnings of his own capital.

It will at once be objected that this process will eliminate profits altogether by including all incomes under the other three heads. But this would not be quite true for several reasons. In the first place, the actual amounts which the business man pays for the hire of these agents of production are only

approximately equal to their marginal products, and the closeness of that approximation varies. He will not knowingly pay more than that, because to do so would involve a loss. Of course the owners of the factors of production will not knowingly take less than their marginal products, because that is what they are really worth, and that is what they can get if they are persistent and skilful in bargaining. But it is never known precisely what their marginal products are at any given time. Under stable conditions of industry, experience would determine that point with a fair degree of precision, and employers would bid against one another for any factor which could be had for less than its marginal product until they would bring up its price. In any case the approximation is brought about by the process known as the higgling of the market, and this continual higgling would, under stable conditions, keep the price of the use of any factor very near the amount of its marginal product.

But conditions in the modern industrial world are never quite stable, and under unstable conditions it is much more difficult to tell in advance what the marginal product of any factor will be. In general the business man is more careful to avoid losing that which he already has than to gain something in addition. Consequently he will be pretty sure to

keep on the safe side when making an offer to the laborer, the landlord, or the capitalist. Moreover, he is in a better position to know what their factors are approximately worth than the other men are. The result is that the factors of production are more frequently employed at a price slightly under than slightly over their marginal productivity. Those business men who make the mistake of paying the latter price, will either correct it as soon as they find it out, or they will be eliminated from business by their failure, while those who pay the former price will be more likely to survive. This means that the business men *as a class*, by reason of their superior advantages in bargaining, receive a share in addition to their net wages, rent, and interest.

The share which results from the business man's superior bargaining power cannot be called the *product* of the business man, for superior bargaining produces nothing. It adds nothing to the amount which the community can produce, but only affects the distribution of the product. It is a purely acquisitive function, and is therefore a factor in distribution, but not properly a productive factor. In the last analysis, the profits of the superior bargaining of business men, as a class, come out of the wages, rent, or interest, of the labor, land, or capital which they hire. What one business man gains off another adds

nothing to the general share of profits; but in so far as he out-bargains the laborer, the landlord, or the capitalist, he does add something to the general share of the business men's profits by taking something from the shares of the other factors.

Care should be taken to distinguish this from the share which the business man earns by the superior organization and management of the factors which he employs. If he can take charge of a group of factors which would otherwise be able to produce $100,000 worth of product, and so manage them that the whole combination can produce $110,000 worth, by the law of marginal productivity, that extra $10,000 worth is his product. That is the amount which the community is able to produce with his help over and above what it could produce without his help, and this is the only sense in which any factor can be said to be productive. But this share belongs properly under the head of wages rather than profits. It is due to the labor of the business man, and that labor is productive in the same sense that the labor of anyone else is productive. His labor is largely mental, it is true, but so also is that of his accountant. As a matter of fact, all labor is more or less mental in character. That is to say, all labor combines both mental and physical exertion, the only difference being that in some forms the mental element is rela-

tively more important, and in others relatively less important. Moreover, the amount which the business man can earn in this way is determined in precisely the same manner, and by the same law, as the earnings of any other laborer.

The law of marginal productivity can be applied to the earnings of business management as well as to the wages of other labor. The amount which any individual business man can get by means of his superior management (not through his superior bargaining capacity) depends upon the amount which he can add to the product of the community over and above the amount which it could produce without his help. That determines how much his help is wanted. But this amount decreases as the number of business managers increases, and increases as the number decreases, in proportion to the other factors. As was pointed out in Chapter II, a law of diminishing returns applies to the product of a given amount of the other factors when managed by increasing numbers of managers. That is to say, the product cannot be doubled, trebled, and quadrupled by merely doubling, trebling, and quadrupling the number of business managers. This means that each additional manager can add less and less to the total product as the number of managers increases more and more.

Even the work of devising and initiating improvements when performed by the business man himself instead of his employees, comes under the general description of labor, and its reward under the general law of wages. If the improvement is made by an inventor who does not himself own the establishment in which it is to be used, his reward is clearly wages rather than profits, whether he be working for stipulated wages, or working independently and selling his inventions. This being the case, there is no good reason why a reward earned in a similar way by the business man himself should not be called wages. If the inventor be working for stipulated wages in a large manufacturing establishment, he may be said to be the producer of the amount which his invention adds to the product of the establishment. Making allowance for the risk of the owner, and the discounting of the future, his real earnings are equal to that amount; and if his employer pays him such a sum, there will be no employer's profits. In so far as the employer discounts that product because of its distance in the future, paying the inventor only the present worth of that future product, he will then realize the current rate of interest on his investment, — that is, on the wages he pays the inventor. The same would be true in case the inventor works

independently and sells his invention to the business man. If the latter pays the present worth of the future product of the invention, he makes no profits but only interest on his investment. But if he succeeds in out-bargaining the inventor in either case, paying him less than the present worth of the future product of the invention, or if the uncertainty of success induces the inventor to part with his invention for a small sum, then and only then will the business man secure profits. Profits are in this case also the result either of superior bargaining or of the uncertainties attending the introduction of an improvement.

In the case of a franchise or other special privilege granted by the public to a business man or corporation, there may or may not be profits according to the terms upon which the privilege is acquired. If the public charges what the privilege is worth, — that is, if it gets fair terms out of the business man or corporation, — the latter may earn interest on the investment and wages of superintendence, but no profits out of the franchise itself. This would not, of course, preclude the possibility of profits from other sources, — for example, from the out-bargaining of laborers or lenders of capital. But if the business man or corporation succeeds in out-bargaining the public, and thus acquiring the privilege for less than

it is worth, it may secure a surplus in the way of profits over and above what may be secured by the ordinary business man.

A catalogue of the special methods by which business men of certain low grades of morals succeed in out-bargaining the consumer and thus securing profits for themselves, would make an interesting study. It is only necessary to mention such businesses as the manufacture of patent medicines and similar articles, the adulteration of food products, and the manufacture of shoddy goods of various kinds — to say nothing of lobbying for tariff duties — to indicate what a fruitful field these methods furnish to those whose moral standards will permit them to enter it.

On a slightly higher plane, but still a distinctly low one, is a method which has been growing in importance in recent years. This may be called the method of terrorism, and it consists in the formation of an organization among the producers of a certain commodity for the purpose of controlling the business. Such organizations uniformly adopt various underhanded and unscrupulous methods of driving competitors out. In short, they attempt to terrorize the business by making it unsafe for a competitor to enter. Ordinarily a competitor will not enter an unsafe business until the profits be-

come high enough to tempt him to face the danger of loss. By thus making competitors reluctant to enter the field, the organization is able to maintain a level of profits determined by the degree of risk which it is able to inflict upon its competitors. That is, the more effectively the organization can terrorize the trade, and the greater the artificial risks it can create, the less competition it will have and the larger profits it can make. This is the method uniformly adopted by trusts, and is, in spite of the claims put forth by their advocates, the chief purpose of their organization.

These methods are all alike in the one particular that they are attempts to secure advantages in bargaining which will enable their beneficiaries to secure a share in distribution over and above what could naturally be earned. They deserve a place in a discussion of the problem of distribution solely because they are recognized methods of doing business, and are not yet sufficiently condemned by the moral sense of the community to place them in the same category with those of the thief, the counterfeiter, and the confidence man. These men also secure shares in distribution by the exercise of their mental faculties, but these shares, like those of the aforementioned classes, represent no service rendered. However, the latter class of occupations are not

recognized as legitimate lines of business, and their shares are therefore not usually considered in a treatise on distribution.

But aside from the artificial hazards created by the trusts and similar organizations, there are certain natural risks in business which are due to the machinations of no one in particular. There are certain gains as well as losses in business which are due to circumstances over which no individual or definable group of individuals exercises any control. Unpreventable changes are constantly occurring in the market to affect the prices of various commodities, and it is the independent business man who gains most or loses most by these changes. The labor, land, and capital which he employs will usually have been contracted for in advance at stipulated rates, and these rates do not adjust themselves at once to the changed conditions. During the interval, the employer is either gaining or losing by the change in the market.

It might be expected that the losses would offset the gains if the business man had absolutely no means of foretelling the future. But one of the functions of the business man is to prognosticate, as best he can, the probable conditions of the market; and there are signs and indications which aid him in this task. Probably no one can tell accurately what

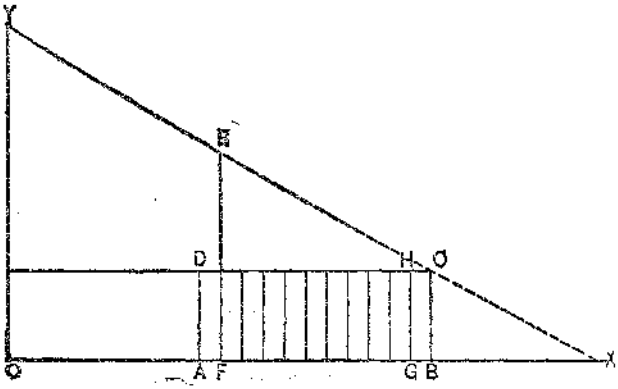
the conditions of any market will be a year, a month, or even a week hence; but capable business men can, on the average, and in the long run, come nearer telling than the incapable ones, and still nearer than those who "go it blind," paying no attention whatever to signs and indications. It is like guessing at the weather. No one can tell positively, even one hour in advance, what the weather will be, but a capable farmer or sailor recognizes certain signs and indications which assist him in guessing, and the result is that fewer are caught in storms than would be if they had to guess blindly, without any indications whatever to guide them. Even the business man's limited ability to prognosticate the conditions of the market will make the losses in the long run appreciably less than the gains, because business men will guess right more often than wrong.

The incomes which business men secure through their ability to adjust themselves to changes in the market, though not technically produced, are yet in a sense earned. By putting their capital at hazard and agreeing to pay stipulated wages, rent, and interest for the factors which they hire, they relieve the owners of these factors from a certain amount of risk. Even these men may lose through the failure of a business man, but not, under the law, until he

has lost all his own capital. Their risk is therefore reduced by having his capital placed in the position of greatest hazard, — that is, in the position where losses strike it first and never reach the other factors until it has all been wiped out. In so far as these other factors are made somewhat safer by this process they can well afford to receive something less on the average than they might otherwise receive, leaving the business man something of a surplus in the long run to compensate him for his greater risk.

This part of the business man's profits is analogous to the profits of an insurance company, which are, of course, different from the premiums received. The real reward of the insurer, whether he be an ordinary business man or a chartered insurance company, is to be found in the excess of gains over losses. In the case of the insurance company it is the total premiums received for assuming the risk minus the loses consequent upon assuming the risk. Here the question arises: How does there happen to be a difference? Why will the patrons of an insurance company pay it more than their total losses, thus leaving the company a profit? Evidently because the risk to the insurer is less than to the insured. In the case of fire insurance, for example, the loss to the insurer in case of fire would include only the money value of the buildings and goods destroyed;

but in the case of the insured it would also include shrunken credit and crippled business. Having capital of his own, his credit is good for a certain amount in addition, but a part, at least, of that credit vanishes with his capital. More important still is the effect of a large and sudden loss as compared with small annual payments upon his consumption. These annual sums are paid, as it were, out of the



last and least necessary part of his income. In order to make these payments, he gives up only the enjoyment of those things which he can best get along without. But a large and sudden loss may deprive him of even the necessaries for a time. This can be illustrated by means of the above diagram.

Let the income of a certain man be measured along the line *OX*, and the utility to him of the

various parts of that income along the line *OY*. That is to say, if his income were represented by the line *OF*, its marginal utility would be represented by the line *EF*; but being represented by the line *OB*, its marginal utility is represented by the line *CB*. Now let us suppose that his business is so hazardous that he suffers a loss of $1000 by fire once every eleven years on the average. He could well afford to pay an annual premium of $100 for the sake of being insured. A hundred dollars paid in any one year would cost him in the way of sacrifice an amount of utility represented by such a parallelogram as *HCGB*. In eleven years he would have paid $1100, which would make a total sacrifice represented by the parallelogram *DCAB*. But the loss of $1000 in any one year would involve a sacrifice represented by the irregular surface *ECFB*. Since this surface is larger than the parallelogram *DCAB*, he would lose less in the way of real utility by paying $1100 in eleven years than by losing $1000 in any one year.

In the case of ordinary insurance, the shifting of the risk from the insured to the insurer does not diminish the number of losses to be borne, but it diminishes the amount of risk because the loss can be more easily borne by those upon whom it is shifted; it bears less heavily upon the insurer than

it would upon the insured. It is for this reason that the insured can afford to pay in premiums more than enough to enable the insurer to meet the losses. This familiar principle of insurance explains how it happens that there are profits in the insurance business.

It is evident that in the case of the business man, as was shown to be true in the case of the insurance company, so much of his gross income as is necessary to cover his real risk, or to make good his losses, is not to be classed as profits. Only that which he wins because of favorable changes in the market, over and above what he loses because of unfavorable changes, can be so classed. How does there happen to be a surplus in this case? It must be, as in the former case, because the risk to him is less than it would be to those whom he relieves of it. As compared with the laborers, it is probable that a given loss would affect him less seriously than it would them. The loss of any considerable part of their wages, which would frequently happen if they bore their own risk, or took their own chances with the market for their products, would mean serious deprivation. But there is no reason for believing that a given loss would on the average affect the business man less seriously than it would the landlord and the capitalist of whom he hires his land and

capital. They are usually in as good a position to bear a loss as he is. But there are reasons for believing that the skilful business man will experience fewer losses than would be experienced by those whom he relieves of risk, whether they be laborers, landlords, or capitalists. This is due to no actuarial principle, as in the case of the insurance company, but to the business man's superior foresight and skill in avoiding losses. That is a part of his special function, and in the performance of it he can be assumed to develop special skill. This part of his income is, therefore, due to the fact that he is able to avoid losses more effectively than the others whom he relieves of their risks. Even if he pays them what they might be expected to earn on the average and in the long run, — counting the losses with the gains resulting from fluctuations of the market and other fortuitous circumstances, — by so managing the business that the losses are reduced and the gains increased, the business man will find himself in the possession of a surplus without having robbed or out-bargained any one. This means that this part of his surplus is due to the fact that he is able to reduce the risk which he assumes below that which the others would have had to carry if he had not relieved them.

But even if the business man is not able to

avoid losses more successfully than the others whom he relieves of risk, he may still secure an income through his function as a risk-taker. The owner of any factor of production will ordinarily accept as hire something less than its average marginal product, on condition that he be relieved of risk. The loss of a given sum out of one's customary income is a matter of more concern than the gain of an equal sum in addition to one's customary income. Almost any one would therefore accept an assured income in preference to an uncertain one, even though the chances were that the uncertain one would average, in the long run, something more than the assured one. Assured wages, interest, or rent, for example, of $1000 a year, would be accepted by the average man in preference to the uncertain earnings of business, even though these uncertain earnings might be expected in the long run to average as high as $1100 a year. By taking advantage of this tendency in bargaining for labor, land, and capital, the business man will therefore find himself in the possession of a surplus, provided he does not fail through sudden losses before he has had time to profit by the average of the "long run."

Let us suppose that a given fund of labor, land, and capital can, on the average and in the long

run, produce $100,000 a year. That is the amount which they would receive if they worked together on the coöperative plan instead of hiring themselves to some employer. But owing to fluctuations of the market and other fortuitous circumstances, this product varies from year to year, some years rising as high as $150,000, and again falling as low as $50,000. Rather than take their chances with these ups and downs, the laborers, landlords, and capitalists will ordinarily be willing to accept a stipulated income of something less than $100,000 — say $95,000 — provided any one is able to make them such an offer with a good prospect of being able to carry out his contract. In that case, the employer will, in the long run, have an income of $5000 a year in addition to the earnings of his own labor of management, or of his own land and capital.

If in addition he is able to develop special skill in prognosticating the conditions of the market so as to slightly reduce the losses, thereby increasing the annual product to $101,000 a year, he will have an average income of $6000. Then if he also succeeds in out-bargaining some of those from whom he hires the factors of production, he will find his income still further increased. In addition to all these methods he may, as already

pointed out, so organize and manage the factors as to make them turn out a larger product than they otherwise would, in which case he will secure a still larger income. But the amount which he earns in this way really belongs under the wages of superintendence rather than under profits. It is earned by the productive labor of the business man, and by a kind of labor which can be, and frequently is, hired at a stipulated salary. When it is so hired, its earnings clearly belong under wages rather than profits, and there is no good reason for placing it under a different head when it happens to be earned by the business man himself. But the function of risk-taking cannot be turned over to an employee working for a salary. It is essentially the function of the business man himself, and he cannot shift it to any one but another independent business man or business concern, and even then in only a few special cases, like fire insurance. The business man is essentially an enterpriser, or an *entrepreneur*, as he is sometimes technically called.[1] Both terms signify one who undertakes or assumes risks. It is the reward of this special function which, together with the results of superior bargaining, constitutes

[1] Cf. The article by F. B. Hawley, on "Enterprise and Profit," in the *Quarterly Journal of Economics*, November, 1900.

the peculiar income of the business man, such an income as is never earned by any one except a business man who undertakes risks.

That part of the business man's income which is due to his ability to reduce his risk by his superior skill in guessing at the probable conditions of the market is very closely akin to his wages of superintendence, and might almost as well be placed under that head as under profits. But inasmuch as it is so closely related to the function of risk-taking, it seems better, on the whole, to include it under the latter head. It is the peculiar reward of the speculator — in the better meaning of that term — whose special skill, if he has any, consists in knowing better than others when to buy and when to sell. Every business man is a speculator in the sense of being compelled to buy in advance upon an uncertain market, and he is the one who profits or loses by such transactions. In so far as this is a necessary part of every business, the income secured by special skill in this direction must be regarded as earned.

Speculation in the purely commercial sense, which consists simply in buying things when they are believed to be cheap and holding them for a rise without any industrial purpose whatever, is not a wholly barren function, though there are few com-

munities in which it is not overdone. Wherever it is necessary that goods should be produced a long time in advance of their consumption, it is also necessary that some one should hold them during the interval. This consists not only in housing or storing them, but also in waiting to get one's value out of them; and waiting, as we saw in the chapter on Interest, is burdensome when carried too far. The producer must wait a long time for his reward, or the consumer must buy a long time in advance of his needs, unless some one else will come forward and relieve them both of the necessity of waiting. The reward for waiting is interest, but in addition to waiting there is the risk of losing. It is as necessary that some one should risk his capital as it is that some one should wait. But no one is likely to do this unless he is tempted by the hope of a profit. Whoever does it under such an inducement is to that extent a speculator. To be sure, he may be several other things besides: he may be a storer of goods, as in the case of the owner of a warehouse, and a distributer of goods, as in the case of a merchant; but in so far as he is merely a buyer of goods when they are cheap and a seller when they are high, he is a speculator.

Let us suppose, as an extreme illustration, that no one were willing to hold any part of a wheat

crop from the time of its harvesting until such times as it was most needed. The whole crop would then have to be used up at once, and in order to be so used, it would have to be put to very inferior purposes, or used in the satisfaction of very inferior wants. Consequently its utility, or want-satisfying power, would be very low. During the remainder of the year there would be a scarcity of wheat, and many important wants would have to go unsatisfied. By holding a part of the crop till it is needed more than it is immediately after harvest, its utility would be greatly increased and the well-being of the community enhanced. Whoever does this holding, whether it be the farmers themselves, the millers, or a special class of speculators, is serving the community by increasing the want-satisfying power of some of the goods in its possession. Whatever in the way of profits is secured by this process may be regarded as payment for this service.

But a great deal that goes on under the name of speculation does not deserve that name, in spite of its opprobrious sound. Gambling is a better name for those transactions which pretend to be buying and selling, but consist really in betting on the course of the market. It is quite as easy for a couple of men, either in or out of the stock market or the board of trade, to bet on the state of the

market at some future time as it would be to bet on the state of the weather; and one kind of betting would serve about as important an economic purpose as another, even though the one was done under the form of buying and selling without any real transfer of goods. However, so long as it is impossible to distinguish for legal purposes between legitimate speculation and gambling under the form of buying and selling products, it is generally considered best to allow them both to go on together, since the one serves an important economic purpose and the other affects only the parties who participate, and does no one else any harm.

It should be observed that there are no profits of gamblers as a class, for what one makes another loses. But in the business of real buying and selling, there is a margin of difference, on the average and in the long run, in favor of those who buy at opportune times — say just after a wheat harvest — and sell when the article is more wanted than it was when it was bought. This margin is due to the fact that the speculator relieves the other classes of the disadvantages and uncertainties of waiting, enabling them to realize a certain price at once, which they will generally prefer to an uncertain price in the future, even when the chances are that the future price will be slightly higher than the present

one. The speculator furnishes a kind of insurance by relieving others of a share of their risk.

It is not to be inferred, however, that all risk is burdensome. The gambling instinct is so strong in some people that they will eagerly hazard their wealth on chances which they know to be against them purely for the excitement of the hazard. Different individuals differ greatly in this particular, but in general it will be found that small sums will be risked on the chance of winning large ones more readily than large ones will be risked on the chance of winning small ones, even when the chances in the latter case are more than proportionally superior. So great is the preference for the former class of hazards that a great many men — one might almost say the majority of men — will risk $1 on the chance of winning $1000, even when it is well known that there are 2000 chances to one against their winning. That is why lotteries flourish where they are not suppressed by law. But very few will risk $1000 on the chance of winning $1, even if they knew that there are 2000 chances to one in favor of their winning. If a company should offer to sell 1000 tickets at $1000 each, out of a lot of 2000, only one of which was a blank, all the rest drawing prizes of $1001 each, it would be making a better offer than any lottery ever has made, or ever could make; but

it would not be able to induce 1000 individuals to buy tickets. And yet such a company would be offering a good risk, as risks go, and any one who would continue buying such risks would gain in the long run, though he might lose all his money on the first venture.

Outside of mining and a few extra hazardous enterprises, industrial and commercial risks belong in the class where relatively large sums must be hazarded on the chance of small gains. Such risks do not appeal to the gambling instinct, and consequently they do not attract men except where the chances are good in the long run, — that is, where the gains on the whole considerably exceed the losses. Those who embark on such enterprises will, in the long run, receive profits. But in such extra hazardous enterprises as appeal to the gambling instinct, by the chance of large gains from small investments, men are so overanxious to invest that the losses on the whole exceed the gains, and there are no profits for such men as a class, though of course a few win large prizes. It is in the former class of enterprises that the "irksomeness of risk" deters men from embarking, reduces competition, and improves the chances of those who have the foresight or the hardihood to enter.

There is a certain parallelism between the risk

theory of profits and the abstinence theory of interest. In the chapter on Interest it was seen that the necessity of waiting for the product of a piece of capital tended to reduce its present value somewhat below the sum total of its future earnings. The one who buys it at its present value and waits for its earnings to mature will, for this reason, secure a surplus in the form of interest. In a similar way, the risk connected with carrying on any enterprise under unstable conditions *may* reduce the present value of the equipment, including the labor employed, somewhat below the probable value of its product, even after allowance is made for interest. Those who undertake such enterprises may be expected, in the long run, to secure a surplus in the form of profits.

But we saw in our discussion of the interest problem that not all waiting is equally burdensome, some waiting being done without any hope or expectation of reward in the form of interest. Similarly, not all risk is equally burdensome, some risks being undertaken for the sake of the excitement of the hazard. In the case of an enterprise which appeals to the gambling instinct, the eagerness of men to buy the risk will give it a value somewhat greater than it is worth, so that they who persist in buying such risks invariably lose in the long run, though they may win

on some of their early ventures. But in the case of an enterprise which does not appeal to the gambling instinct, men are so reluctant to buy the risk that its market value is usually less than its real worth, and men who persist in buying such risks inevitably gain if they continue long enough and are not ruined by early losses. In the former class of enterprises there are no profits, but losses instead, for the adventurers as a class. In the latter class of enterprises there are profits for the adventurers as a class.

In view of all that has been said, we may conclude that profits include only what is left after the other shares are paid. This does not mean that profits are a residual share in the sense that the others are determined independently by laws which affect them each alone, leaving profits as a share which can be determined by no law except that of subtraction. There is no such thing as a residual share in that sense, for any change which affects one share will affect them all in one way or another. They all mutually help to determine one another. But in a very concrete sense the profits of a given business man are what he has left after paying all his expenses and allowing himself wages for his own labor; such wages as he could command in the market if he were to offer to work for some one else, besides interest on his own capital and rent on his own

land; such interest and rent as these factors would bring on the market.

This surplus is, like the other shares, the immediate result of bargaining, but in this case there are several sets of circumstances which enable the business man to bargain so as to have a surplus left after paying for the other factors of production. The first is his superior knowledge of the actual conditions of the market and of the inside workings of his business which enables him to tell better than the members of any other class what the marginal productivity of the various factors really is at any one time. The second is the deception which is frequently practised in order to out-bargain the consumer; the third is the method of terrorism; the fourth is the uncertainty and risk normally attending an independent business which makes the average man willing to accept a stipulated sum as wages, rent, or interest, even when that sum is slightly less than he might be expected in the long run to earn. And finally, there is the business man's superior ability in guessing on the probable fluctuations of the market, which enables him to reduce his risk slightly below that which others less skilful in this respect would have to face.

Under stable conditions of industry some of these sources of the business man's profits would tend to disappear. When it can be pretty definitely deter-

mined what the marginal productivity of any factor of production really is, as could be done if industrial conditions should remain stable for a considerable period, the business man's advantage in bargaining would no longer exist. Moreover, under similar conditions of stability the risks of business would either disappear or be greatly diminished. Whether the other occasional sources of profits would also tend to disappear or not, would depend upon whether or not the community's intelligence and moral sense continued active under stable conditions. If they should, they would probably succeed ultimately in weeding out the immoral and unscrupulous methods of securing profits, a thing which the very instability of the present period renders exceedingly difficult.

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