The Positive Theory of Capital and Its Critics

Author(s): E. Bohm-Bawerk

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THE POSITIVE THEORY OF CAPITAL AND ITS CRITICS.

III.

THE VIEWS OF MR. WHITE, MR. BILGRAM, PROFESSOR MACVANE, AND MR. HAWLEY.

THE abundance of proverbs which declare that it is difficult to suit all persons at once, proves how common this experience is. Certainly, the establishment of a theory of capital brings no exception to the proverbial experience. In the preceding articles I have discussed two of the most prominent criticisms which have been directed against my theory of Capital. In this concluding article I propose to consider three other and noteworthy criticisms. If, now, these criticisms are compared, the interesting result appears that they have nothing in common except that something in my theory is declared to be unsatisfactory. The particular object of dissatisfaction is a different one for each critic; and each indicates a different route as that which I should have followed, in order to escape blame and earn praise. Professor Clark, as we

have seen, has asked a different definition of capital. President Walker has demanded a return to the productivity theory.* As we shall presently see, Messrs. Horace White, Bilgram, and Hawley find each a very different point as the fundamental error in my theory, and suggest each a different path as that which will bring a solution of the problem. Perhaps the author who is thus attacked on so many sides is justified in finding consolation in the certainty that the different critics obviously would have found it more difficult to come to agreement among themselves than to unite in acceptance of his own views.

Let us now turn to the varying criticism presented by the writers I have just mentioned.

Mr. Horace White finds the weak point of my theory in the proposition which I have laid down as established by experience, that the roundabout and lengthened processes are more productive than direct processes.† He asserts, more especially, that he could admit this proposition to be an explanation of interest if it were really a universal rule; but such it is not.‡ To prove that it is not, he brings forth two bits of testimony or argument. First, he refers to my own testimony. I am said to have limited the proposition to the cases in which the roundabout process is "wisely chosen," thus admitting that my proposition does not hold good universally. Secondly, he refers to the testimony of experience. Experience shows that "the most marked and distinguishing feature of the modern industrial world is *not* the lengthening of processes of production or the employment of larger capitals and more roundabout ways to produce a given quantity of products, but the shortening of processes, the employment of less capital and less roundabout ways." By way of example, Mr. White mentions "boring for oil instead of

*See vol. ix., Nos. 2 and 3 of this *Journal*.

† *Bohm-Bawerk on Capital*, in *Political Science Quarterly*, vol. viii. pp. 133–148.

‡ *Ibid.*, p. 144.

sending ships to the Arctic Ocean to catch whales"; the modern applications of electric power, which are more direct and less roundabout than the steam machinery they have superseded; further, perfected printing presses, modern processes of making steel, and so on. Mr. White summarizes the results of his observations thus: "The fact is that the two methods of production — the longer and the shorter, the more roundabout and the less roundabout — hold the realm of mundane affairs together, but with the preponderance in favor of the latter. . . . What mankind is ever striving for is not to get more with more, but to get more with less. . . . In view of such considerations it *cannot* be regarded as an empirical fact that roundabout and lengthened processes are more productive than direct processes." *

What conclusions Mr. White draws from these premises for his own theory of interest we shall see presently. For the moment, I will consider what and how much is proved against my own explanation.

I believe that this is another of the instances so common in the theory and critical discussion of capital, where the contestants argue at cross-purposes. Mr. White combats certain propositions which I have never maintained, and brings forth, by way of objection, facts which are perfectly familiar to me, to which I have called attention in the presentation of my theory, and which are in perfect accord with that theory. None the less, I am sincerely grateful to him for having raised these objections. For, if an interpreter as acute and as candid as is Mr. White has misunderstood me, I must fear that the same has been the case with many another reader; and this, notwithstanding the great pains which I had already taken to prevent misunderstanding on just this point.† I am glad, therefore, to take the opportunity to express myself more

* *Bohm-Bawerk on Capital*, in *Political Science Quarterly*, vol. viii. pp. 136, 143, *seq.*

† See *Positive Theory of Capital*, pp. 83, *seq.*

precisely, and ask only for attention and forbearance. I ask for attention because certain difficult points really call for it; and for forbearance because, in order to remove the doubts and misunderstandings that have appeared, I shall enter on detailed discussions which may seem superfluous to readers who, from the outset, have followed my meaning.

Above all, we are to inquire what is the actual empirical fact in regard to roundabout processes.

Mr. White lays great stress on the circumstance that there is no universal rule by which the roundabout processes are more productive than the direct processes. If he uses the word "universal" here in its most strict and literal sense, he is doubtless in the right. It cannot be maintained — and I have never meant to maintain — that literally every roundabout process, no matter how stupidly it may have been selected, is more productive than every more direct process, no matter how ingeniously chosen. On the contrary, we must admit at least two large classes of exceptions. In regard to the first exception we are completely in agreement as to the facts. It is unquestionable, and is indeed a matter of course, that circuitous routes which have been unwisely chosen do not bring greater product. If, for instance, I should employ a number of laborers for a couple of months to produce lead or some other soft metal, and make therewith a steam plough which is twisted at the first use, or is torn to pieces by the expansive power of steam, the circuitous route, which consists in the making of such an agricultural implement, would unquestionably bring no advantage in production. I have therefore carefully and intentionally limited my proposition to "wisely chosen" methods.

But it is quite a different question whether this qualification alters the intent of the entire proposition in such manner that the circumstance leading to greater productiveness is no longer the length of the processes, but the

shrewdness of the producer. Mr. White seems to be of this opinion, which I do not share for reasons to be presently set forth in detail. At this point I will only indicate my opinion by an analogy which seems to me to illustrate it effectively. No one will dispute the proposition that fertile lands are more productive than less fertile lands. It is equally certain that this advantage of the fertile lands only appears if the farmer pursues a wisely chosen method of agriculture. The fertile land will yield not more product, but less, if the farmer plants on land which is fit for wheat, forest saplings or grape-vines, if he cultivates wheat on land which is fitted for the vine or the forest, if he is too late or too early in ploughing, sowing, harvesting. But does the proposition that fertile lands are more productive therefore cease to hold good as an independent truth, and are we to find in it only a concrete illustration of the quite different proposition that capable farmers get larger returns than incapable? I do not believe that Mr. White would be disposed to draw this conclusion. Yet the analogy with the case here under consideration is obvious enough. To this point, however, we shall return in due time.

A second set of exceptions is found in those ingenious inventions which make it possible to secure a larger product through processes of production which are shorter or more direct than those previously in use. Such inventions doubtless there are, and I have myself referred to them. Mr. White, indeed, was so good as to cite the passage in which I did so. But I believe that Mr. White labors under a misapprehension as to the nature of these exceptions, and as to their significance for the problem in hand. We reach here a point which seems to me to be by far the most interesting and the most difficult in the whole controversy. It may therefore receive very careful consideration.

Mr. White would deduce from these shortening inven-

tions a second and opposite rule from that of the greater productiveness of the roundabout processes,— a second rule which is co-ordinate with the first in the manner and extent of its application. The second rule shares the control of practical life; nay, exercises a preponderant control. Let me quote once more his own words: "The fact is that the two methods of production — the longer and the shorter, the more roundabout and the less roundabout — hold the realm of mundane affairs together, but with the preponderance in favor of the latter."

This proposition would hardly have been laid down by Mr. White, had he given attention to the simple yet important difference which in fact exists in regard to the feasibility of securing a greater product by one or the other method. When can we make use of the first method for securing an increase of product; namely, that of the lengthening of the process of production? I answer: always, as often as we wish, and with no other condition than that we should dispose of a fund large enough to afford subsistence for us and our laborers over the lengthened period of production.* We are not under the need of making a new invention for this purpose, or of awaiting one. Inventions for processes of this sort already exist by the thousand, and are, so to speak, on hand, waiting that they shall be used. As I have already stated: "It may be confidently maintained that there is not one branch of production the returns of which may not be considerably increased in this way, as against the method of production prevailing at the time; and that without any new invention, but simply by the intercalation of intermediate members long familiar to capitalist production,— whether it be by the adoption of a steam motor, or an apt transmitter, or some ingenious gearing, blast, lever, regulator, or the like. How far behind, in-

* Or, what comes to the same thing, a fund for purchasing instruments and machines for whose production another capitalist has advanced subsistence to laborers.

deed, in capitalist equipment are the most of our agricultural and industrial businesses compared with the most advanced typical businesses! And, certainly, these latter are no less far behind an ideally perfect equipment." *

The opportunity to make use of this method thus lies at one's disposal at any moment. Any person of average intelligence, if only he be not positively stupid, every common artisan or farmer, can make use of them if he simply possesses a sufficient fund of present goods wherewith to make the necessary advances for the labor to be invested in the roundabout process, such as buying a sowing-machine or a threshing-machine, building the best barns for his cattle, digging drains, or making use of these various improvements together or in succession. Every creation or increase of fixed capital belongs here. This opportunity exists at all times, even in static economic conditions, within the range of existing knowledge or experience, and doubtless exists in every branch of production permanently.

Let it be added, briefly, how it happens that enough of these opportunities are always available. For the simple reason that they cannot be utilized without having capital; that is, without having more capital than was previously at hand. Suppose a machine to be invented. It is not enough to know how to make it. There must be capital to make it, and to buy it; and in each year only so many machines will be produced as is made possible by the means of those who have occasion to use it. At the same time there are always thousands of persons who know of the existence of the machines, who would be glad to secure the advantage of their use, but who do not dispose of the capital necessary for their purchase. If, now, dollar after dollar is saved, the utilization of the invention proceeds step by step; but the opportunity is not exhausted until the very last of the producers has the

* *Positive Theory*, p. 86.

means to add the machines to his possessions. This end, however, has not been practically reached, perhaps, in any single invention, least of all in every invention.

On the other hand, when can we make use of the second method; that is, the method by which an increase of product is obtained by a shorter route? Only so often as in some single branch of production a particularly happy discovery or invention is made, which meets at the same time both desiderata. It may be remarked, by the way, that such inventions may be numerous absolutely, yet are unquestionably rare in comparison with the whole number of technical inventions. It is obvious that it is much easier, and it therefore happens much oftener, that one of the desiderata shall be met — a simple increase of product — than that both desiderata shall be met,— an increase of product by a shorter method. To illustrate: it is much easier to build a furnace having a double heating capacity, with an increase in the consumption of fuel, than to build a furnace which shall not only double the heating capacity, but have a diminished consumption of fuel. So it is much easier to construct locomotives or marine engines which have greater power and greater weight than the engines previously in use than it is to build machines which combine greater power with less weight. It is the difficulty of the second problem which has so far stood insuperably in the way of all attempts at aerial navigation. Coming now to the case in hand, the inventions which require a larger investment of capital (such as railways) are much more numerous than the inventions which bring about an increase of productiveness with a diminution of capital, not to mention doing away with capital entirely.

The most important point, however, is this. Even if an invention of the latter sort is successfully made, it none the less does not set aside the rule that a larger product is secured by the more roundabout process: it does not even

do so in the particular field in which the invention is operative. This may seem a paradox, yet it is perfectly simple.

Consider any one of the examples which Mr. White adduces. Take the example of boring for oil instead of sending ships to the Arctic Ocean to catch whales. No doubt, the fortunate discovery that the interior of the earth contains great spaces filled with oil brings an opportunity to get by the direct method a larger supply of oil than had been got by the whale fishery. But the utilization of this very discovery is subject from the first moment to the rule that through the lengthening of the process of production a greater product is secured. Is the direct method of boring by unaided human labor, or even with spade and pick and hand-drill, the most effective? Is it not more effective to resort to the circuitous route? to build machines, to apply steam-power or water-power or electric power, which has been created by a more or less distant water-power? Again, which is the more productive, to carry the oil from the point of production by the more direct method, on a wagon over the highway (which, by the way, is itself a roundabout method), or to build a railway by previous labor, perhaps construct a pipe-line through which the oil is carried to the great centres without trans-shipment? In short, notwithstanding the invention and in the very field of the invention, the rule still holds good that the longer method brings the greater product.

This rule would fail to hold good only if there were inventions whose effect would be that an increase of product was always secured, the shorter the mode of obtaining it: thus, if it appeared that not only was the supply of oil increased by boring in place of the whale fishery, but also that boring without machines, water-power, electric apparatus, was the more effective,— if, in fine, the very greatest product were obtained by the unaided hand of

man. I think I can safely affirm that such inventions never have been made and never will be made. It is as unlikely that they will be made as that a system will be discovered by which a locomotive will accomplish more in proportion as its weight becomes less,— by which, for instance, a locomotive weighing sixty tons shall have three hundred horse-power, one weighing thirty tons four hundred horse-power, one weighing three tons a thousand horse-power, and one which weighs perhaps half a ton quite two thousand horse-power! Even the most successful inventions in this field evidently have only some such effect as the following. Suppose a previous machine with a weight of sixty tons to have had three hundred horse-power, and that an ingenious invention makes it possible to build one with a weight of thirty tons that develops four hundred. But even in this case it will appear that the power of the machine will be increased by adding to its weight. Machines on the new plan with a weight of forty tons will develop more power than those weighing only thirty tons. Sixty-ton machines will be more powerful than forty-ton machines, and so on.

Let me offer still another example, which, I believe, gives the most exact and most instructive parallel for the case in hand. The case is that of agricultural improvements. It cannot be denied that a fortunate invention in the field of agricultural chemistry may bring it about, that a larger product will be secured on less fertile land than was previously secured on more fertile land; that, for instance, land of grade II. will yield 100 bushels, whereas land of grade I. previously yielded only 80 bushels. But nothing is more certain than that the application of the new invention to land of grade I. will cause this to yield an even greater product, say 110 bushels. Under such circumstances it would be obviously mistaken to assert that the invention in any way destroys or weakens the rule that more fertile land yields a larger product

than less fertile land. It would be equally mistaken to assert that in practical affairs there are two opposing facts or tendencies: one, that fertile land yields more than unfertile; another, that unfertile land yields more than fertile. Most mistaken of all it would be to assert that the frequent discovery of inventions makes the latter rule preponderant. The source of error is obvious. The inventions do not give to less fertile lands an advantage as compared with fertile, but simply change the plane of productivity for both. The better land still maintains its advantage over the worse.

This is precisely the situation in the matter of the roundabout methods of production. Inventions bring about a new and higher plane of productivity, which redounds to the advantage of both methods without destroying the relation between them. Before the invention the longer method of production was more effective than the shorter, and it remained so after the invention. The newly discovered shorter process has an advantage only as compared with the specific longer method which had been used in the past, but which, in view of existing knowledge, can no longer be said to be wisely chosen, and which is superseded *on this ground only*. It does not for a moment enjoy the advantage as compared with the longer method in general, but from the first it becomes inferior to those more roundabout processes of production which can be undertaken on the basis of the new discoveries. As I have explained in the examples just given, and could explain with a hundred other examples, boring for oil is better and shorter than catching whales; but boring for oil by the roundabout process is more productive than boring for oil in the more direct way.

So much as to the facts. Let us now take a further step, and ask, What is the theoretic importance of these facts for the explanation of interest? or, to express it more accurately, How far is it necessary to prove the valid-

ity of the proposition that roundabout processes are more effective, in order to proceed thence to that explanation of interest which I have set forth in my theory?

Here, again, there seems to be a mistake or a misunderstanding on the part of Mr. White. He says expressly that the rule must be a universal one, obtaining without exception, in order to be regarded as "a cause of interest" in the sense of my theory. This seems to me an unfounded assumption. So far as the origin of interest is concerned, it is immaterial that the rule should fail to hold good in some cases, or even in many cases, provided only that there be a sufficiently large number of cases in which it does hold good. The essential thing is simply that more opportunities for increasing the product through a lengthening of the period of production should be available than are in fact utilized with the existing stock of capital or stock of present goods. The case is exactly the same as when foreign exchange goes to a premium, more bills for effecting payments abroad being wanted than the market supplies. In such a case it is obviously immaterial that there should be some people, or a vast number of people, who have no occasion for making payments abroad, and do not want bills for making such payments. The only important thing is that bills are wanted in such quantity that the supply does not suffice to meet the demand.

So in the case here under discussion everything turns on the question: Are there, in the existing economic conditions, opportunities not utilized through which the quantity of the output can be increased by lengthening the process of production, by intercalating capitalistic steps, by the increase of fixed capital? Are there farmers, manufacturers, miners, who could improve their methods of production by the increased application of capital — apart from new inventions — if only they had the necessary funds? Are there useful railways or canals, advan-

tageous cables, promising water-works, which have been left unmade simply because the existing funds do not suffice for all purposes? I am sure that Mr. White would not be disposed to deny this. But, with this, everything is admitted which is necessary for my explanation of interest. I have maintained, and now maintain, that the supply of present goods, demand for which rests on the possibility of increasing productiveness by a lengthening of the processes, does not even in the richest communities exceed the demand, and that this economic relation is the cause of the premium on present goods; that is, of interest.*

It may indeed happen that occasionally, or even frequently, inventions are made which in some specific branch of production make possible a shortening of the processes, and so a diminution of the investment of capital. But the consequence is simply that the capital so set free becomes available for the utilization of other circuitous methods which have been neglected because of the lack of funds. This will happen, as has already been indicated, within the very field of production in which the shortening invention has been made. If, for example, the discovery of petroleum sets free ships and equipment for the whale fishery to the value of ten millions of dollars, it is probable that not a less sum, but a greater, will be required for the complete equipment of the new method of production in the way of boring implements, railways, pipe lines. If not, there are a thousand opportunities in agriculture, manufacture, and transportation for securing an increase of productiveness through a prolongation of the period and a greater use of preparatory labor.†

*See *Positive Theory*, pp. 330–336, especially p. 332; also p. 86; and compare the foot-notes at pp. 86 and 335.

† It may also be remarked that, even apart from what is said in the text, shortening inventions bring about, not a diminution, but an increase in the demand for capital in the period of transition which must elapse before they are completely established. For the new method of production in any case re-

So much by way of explanation and defence of my own theory. And now a few words in criticism of the theory which my honored opponent presents. From the circumstance that circuitous methods of production, in order to be profitable, must be "wisely chosen," he draws the conclusion that the true explanation of interest is to be found in the intelligence of producers. The truth he finds in the theory which "tells us that interest exists because there are men in the world who know how to get a surplus result from the use of capital." These people are the "captains of industry," who are "rare in every community," and without whose intelligence "interest could not exist any more than poetry could exist without the poetic temperament, or art without the artistic taste." To the question which is presented by the problem of interest, Why a commodity whose cost of production is $100 is worth not $100, but $105, Mr. White gives the following concise answer: "Because the man making the commodity *was a smart fellow.* He understood his business. If he had not been a smart fellow and had not understood his business, the product might not have been worth even the original $100, but only $90."

I think it can be easily shown that in this explanation Mr. White has followed the wrong track. The talents and the good fortune of the rare captains of industry affect earnings of management, but not normal interest on capital. If Mr. White would consider impartially the facts, two of importance would not escape him. In the first place, not only the captains of industry — of whom Mr. White himself says there are few in every community — secure interest on capital, but millions of persons of the

quires *some* additional capital, while the capital invested in the old and incomplete method cannot be at once withdrawn. Before, there was investment in the whale fishery only: after, the same investment for a while in the whale fishery (the capital being simply not renewed), and, in addition, apparatus for boring for oil. In so far, the shortening inventions operate in the first instance to cause an *increased* resort to new roundabout processes, since the newer and shorter method usually takes a path of its own.

most ordinary intelligence do so. Your every-day farmer, artisan, or huckster, does so, provided only he is not exceptionally stupid or unlucky. Secondly, with the same intelligence and the same fortune, all these people get a larger return if they have a larger capital, and a larger return with a smaller capital than with none at all. This circumstance seems to me to make it clear as day that, when intelligence and capital work together, the whole return is not to be ascribed to intelligence, but that for some part of the combined return — namely, for the normal rate of interest on capital — an objective cause must be found, which does not lie in the person of the capitalist.

I cannot make this more clear than by returning once more, and for the last time, to the analogy of land and its rent.

There can be no doubt that a person who cultivated with great stupidity and with great ill-luck (say, from hail) the best of wheat-land, or even the famous Johannisberg vineyard, might fail to secure a rent. But would this justify the conclusion that the true source of rent is to be found in the circumstance that the cultivator is a smart fellow? This same smart fellow unquestionably would get a smaller product from less fertile land or a less favorably situated vineyard; while, on the other hand, even on the best land the fellow who is less smart would be able to secure a certain differential return. Such facts have been rightly regarded in the theory of land as conclusive proof that the surplus which land yields has an objective cause, to be found not simply in the person of the cultivator, but in the land itself; and it is familiar enough that the theory of rent has found this objective cause in the greater fertility or better situation of the land which yields rent.

Just as in the case of land, so in that of capital there is an objective chance of a return of a certain average height,— as, for example, four per cent. As in the case of

land, this chance can doubtless be destroyed by stupidity or ill-luck, and can be increased by unusual skill or shrewdness. It is the variations from the normal rate which in the one case and in the other are to be set to the personal account, but not the normal chance. For this latter there must be some separate cause existing on the side of capital. The theory of interest for the last hundred years has sought to discover the cause; but Mr. White has surely not discovered it, when he ascribes everything to the personal qualities of the entrepreneur.

Mr. Hugo Bilgram * is led to conclusions differing from mine in regard to interest, because of different conclusions on the theory of value. The greater part of his controversial article is, therefore, given to the subject of value. Here, as elsewhere, I refrain from discussions in this field, because I have already made it the subject of a separate publication.† I content myself, therefore, with a very few remarks.

Mr. Bilgram lays great stress on the influence of cost on value. To this I have no objection. But he says repeatedly that the Austrian economists have quite overlooked this influence. ‡ I believe that what I have said in earlier and in later writings entitles me to protest vigorously against this interpretation. To avoid repetition, I refer again to my article on the ultimate standard of value. § This question of the relation of cost to value, in fact, illustrates once more the point to which I referred

* *Comments on the Positive Theory of Capital*, in this *Journal*, vol. vi., No. 2, pp. 190–206.

† *Der letzte Maasstab des Guterwerthes*, in *Zeitschrift fur Volkswirthschaft, Sozialpolitik, und Verwaltung*, vol. iii , Heft 2 ; translated in the *Annals of the American Academy of Political and Social Science*, vol. v., No. 2.

‡ "He [Bohm-Bawerk] *eliminates cost of production* as a factor in the determination of value " (p. 194) ; " the Austrian theory of value, ... *ignoring the difficulty of attainment* as a factor in the determination of value " (p. 197) ; and so p. 200.

§ See *Annals of the American Academy*, vol. v. pp. 15, 58.

at the outset of this paper,— the difficulty which an author has in making his work acceptable to all critics. Mr. Bilgram discusses the conception of cost, and he blames the Austrian economists for regarding the value of materials as a constituent of cost; for, says he, further analysis would show that this item of cost resolves itself simply into labor. The view of the Austrian economists is, therefore, declared to be a "very superficial view." Another of my critics, Mr. Hawley, also discusses the question of cost. He finds that this expression has "but one legitimate scientific meaning." And what is this meaning? It is precisely that individualistic conception of cost which Mr. Bilgram attacks,— that conception which looks simply to the expenses of the entrepreneur, and which includes not only what he has paid for interest and wages, but "what he pays for raw materials." * Now, what do we Austrian economists, thus attacked on both sides, really have to say? We have attempted to be less one-sided than our critics. I refer the reader to those paragraphs in my essay on the ultimate standard of value, in which I have endeavored to show not merely that several different meanings are attached to the word "cost," but that no one of these can have a scientific monopoly, each having for different scientific tasks its justification and importance. †

In Mr. Bilgram's criticism on my theory of interest proper I have been especially struck by certain arguments through which Mr. Bilgram undertakes to refute my assumption that, on the average, present goods (which Mr. Bilgram prefers to call "mature" goods) have a higher value than future or immature goods. He begins by remarking (at p. 203), quite justly, that the capitalists who save for the future thereby show that as to themselves they value future satisfaction more highly than present satisfaction. This is true, and has been emphatically and

* See this *Journal*, vol. vi., No. 3, p. 295.

† *Annals of the American Academy*, vol. v. pp. 10, 57.

repeatedly set forth in my *Positive Theory*.* But, so far as my explanation of interest is concerned, it is not essential that all persons should set a higher value on present goods. It is only essential that so many should do so as to make the resultant of demand and supply inure to the advantage of present goods. Against this, now, Mr. Bilgram presents two peculiar arguments.

He describes the demand and supply of present goods as if they came exclusively from lenders and borrowers. The lenders, who save capital, set a higher estimate on future goods than on present. But only that person can be a borrower who has credit, and only he can have credit who himself has property. Consequently, says Mr. Bilgram, "the demand for loans can never exceed the amount of existing wealth. . . . The desire to delay consumption for the purpose of accumulating wealth . . . must by far exceed the demand for present goods from those who are entitled to credit." The final result can therefore not be "a preference for present over future goods," but, on the contrary, a "negative rate" of interest (p. 205).

To this reasoning I will offer not many objections, but only one. As I have specifically said in my *Positive Theory* (p. 331), the demand for present goods, in that market for the means of subsistence in which interest arises, is exercised only to a very slight extent by borrowers. I have there expressly said that those who borrow for consumption are only a small number of persons, and that those who borrow for productive purposes — that is, those who wish to employ laborers with the borrowed capital — form only a transitory stage, which is not to be considered in regard to the final outcome. The main demand for present goods does not appear therefore in the form of borrowing, but in the form of the offer of the unripe good, labor, in exchange for ripe means of subsist-

* *Positive Theory*, p. 315.

ence. And I have explained with some care how and why this main demand has, not perhaps literally, but practically, no limit whatever, and exceeds the supply of present goods (pp. 332, 336). Mr. Bilgram's objection, therefore, even if it were more tenable than it seems to me to be, does not touch the crucial point of my reasoning.

Still more surprising is a second objection set forth by this critic. He says: "Indeed, the fact that immature forms of wealth are being produced as well as mature forms refutes the assumption that the latter are preferred." This reasoning would be effective if there were a choice between equal quantities of ripe and unripe commodities, and if under these circumstances the production of unripe commodities were preferred,— if, for example, mankind, rather than produce a hundred bushels of grain directly, were to prefer with the same amount of labor to produce unripe commodities, whereby later to secure the hundred bushels of grain. But this is not the actual situation. We produce unripe and intermediate products only because otherwise we should have no consumable commodities or a smaller quantity of consumable commodities. We produce unripe intermediate products for the same reason that we crack nuts; not because we prefer cracking nuts to eating them, but because we must crack them before we can eat them. Would Mr. Bilgram really infer from the fact that nuts are cracked as well as eaten that eating them is not better than cracking them? I doubt whether he would do so; and I turn now to another point, — my critic's own conclusion as to the cause of interest.

As has already been intimated, Mr. Bilgram lays great stress, and rightly, on the law of cost. This seems to him to be the key to the whole explanation of interest. He distinguishes three classes of products. First, those whose production grows,— namely, those whose price is greater than their cost, and which, therefore, tempt to an increas-

ing production; second, those whose production decreases, their price being less than their cost; finally, those which are produced at a persistent rate, their value being equal to the marginal cost of production (pp. 195, 201). In fact, the great majority of goods belong in the third class; and Mr. Bilgram confines his investigation as to the origin of interest to these goods of persistent reproduction. Now, interest he believes to be an excess of value over cost of production. But with goods of persistent reproduction value equals marginal cost. Consequently, there is no excess for the marginal producer, and interest cannot accrue.

What follows? "No alternative is left but to seek the *cause of interest in the difference of cost to different producers.* Those sellers who can produce cheaper, and whose limit is accordingly below that of the marginal seller, can realize from the sale of their products an excess over and above cost of production; and this difference in cost of production constitutes the only field in which the law of interest on capital can be looked for."

I should be disposed to ask Mr. Bilgram a question. Does he believe that a man of affairs would permanently continue an enterprise in which the invested capital does not earn interest? I have no doubt that my honored critic would answer to this question, No. In fact, every man of affairs expects, in addition to repayment of his other expenses, to receive the minimum rate of interest on the capital invested, whether his own or borrowed at interest. If this is the case, the reasoning of my neighbor contains a *contradictio in adjecto.* If this is so, his marginal producer who receives no interest is not a real marginal producer, but one who is on the point of abandoning the field. The product which he turns out is not the product of persistent reproduction, but one which belongs in the class "the production of which is falling off." And with this the further conclusions of Mr. Bilgram, which

are expressly based on this unfounded assumption, fall to the ground. The underlying cause of Mr. Bilgram's mistake is easily found. It lies in his intolerant attitude towards the conception of cost. He will admit no scientific importance for that individualistic conception which classes under "cost" everything which the entrepreneur expends or sacrifices. He overlooks that just this conception is an essential one in judging whether a man of affairs will permanently continue the production of a commodity or not; and, in this conception, interest on the capital invested appears as a constituent element of cost.

Another suggestion of Mr. Bilgram's, however, seems to me to deserve careful attention; namely, whether, in place of the phrases "present goods" and "future goods," the expressions "mature" and "immature" goods should not be used. He touches here the same point that was touched in a criticism of Mr. Green's, who remarks: "By present goods I mean goods at hand as contrasted with goods to be had in the future. The use of the terms present goods to indicate goods ready for consumption, in contrast with consumption goods, is confusing." *

The bearing of this suggestion needs to be explained. There are two different classifications of commodities, which do not follow the same lines, and for which it is desirable to have different terms. The one classification is that of goods as they are physically available now or in the future. This is indicated by the terms "present" and "future" goods, in their literal sense (in German, "gegenwärtige" and "zukünftige Güter"). The second classification, and the more important one for the theory of capital, draws the line between commodities available for satisfaction in the present and in the future. In this the goods available in the present are only such mature consumption goods as are physically available. On the side of the

* See Mr. Green's paper on Wieser's *Natural Value*, in the *Annals of the American Academy*, vol. v., No. 4, p. 66, note.

future belong, first, all commodities which are not yet physically at hand; and, second, all unripe production goods, even though they be physically at hand. The German language indicates this second classification by expressions very similar to those just quoted, yet clearly distinguished from them. It uses the compound words "Gegenwartsgüter" and "Zukunftsgüter." The English language seems not to allow this formation of compound words. Hence Mr. W. Smart, to whom I am indebted for the very excellent translation of my book, was compelled to use for the second distinction the same expression which served for the first, and spoke of "present goods" and "future goods." But, in order to make clear that these phrases are not to be understood in their literal sense, in which they would serve to indicate only the first mentioned distinction, he has cautioned the reader, by pointing out that he uses them for want of better, and has, moreover, inserted in brackets the corresponding German phrase (*Zukunftsgüter*).* None the less, "present" and "future" goods are used in two senses, and I have no answer to make to those who consider it desirable to avoid such a double use of language. Whether this can be done most advantageously by following Mr. Bilgram's suggestion and speaking of "mature" and "immature" goods, or by finding some other even better English expression for the second distinction, I must leave to those who are more competent in the matter than I am.

That differences of opinion on the subject of value lead naturally to differences on the subject of capital is shown in the case of still another of my critics. Professor Macvane, in an essay published as early as 1890,†—an essay which in clearness on the essential points of difference,

* *Positive Theory*, p. 242.

† *Böhm-Bawerk on Value and Wages*, in this *Journal* for October, 1890, vol. v., No. 1.

in accurate scientific statement, and in courtesy of tone, could not be improved on,— has set forth in what manner his views diverge from mine on both topics. The points in controversy on the theory of value have since been further discussed by him in two later essays on *Marginal Utility and Value* and on *The Austrian Theory of Value*,* and by myself in the paper to which I have already referred. I will not, therefore, enter here on any consideration of our differences on this part of the subject, but will confine myself to some words of reply to certain criticisms which my distinguished opponent has directed against my theory of capital.

Professor Macvane does not deny, as Mr. White has done, that the use of circuitous methods of production yields in general larger returns for labor than direct methods; but he has his doubts as to certain further assumptions which I have made in connection with this proposition.

I had laid it down that, in general, there is a tendency for a diminishing rate of increase, in the product per unit of labor, with the lengthening of the period of production. I can explain my meaning most simply by reprinting certain illustrative figures which Professor Macvane also has used: —

Productive Period.	*Yearly Product for Each Laborer.*	*Increase.*
1 day (no capital)	150	—
1 year	350	200
2 years	450	100
3 years	530	80
4 years	580	50
5 years	620	40
6 years	650	30
7 years	670	20
8 years	685	15
9 years	695	10
10 years	700	5

*See this *Journal* for April, 1893, vol. vii., No. 3; and *Annals of the American Academy of Political and Social Science*, vol. v., No. 3.

The particular figures have been chosen simply for illustration, and their details have no importance whatever. Indeed, I have expressly pointed out that exact figures cannot possibly be given, that the proportions are different for every branch of production, and that they shift with every invention. What alone is important for my theory is a tendency: that, for example, if the first extension of the period of production from one day to one year brings an increase of 200, a further increase of five years will *not* bring $5 \times 200 = 1{,}000$; an extension to ten years, *not* $10 \times 200 = 2{,}000$; an extension to one hundred years, *not* $100 \times 200 = 20{,}000$. At some point or other the increase in product ceases to progress at the same rate as the extension of the period of production.

Professor Macvane regards this assumption of mine with sceptical suspicion. He finds that in practical experience, to which I also had referred as the only possible source of proof, the tendency is not sufficiently verified. I had used certain specific examples: stone hatchets compared to steel axes; bows and arrows, and guns; the primitive instruments of fishery, and nets and boats. Professor Macvane suggests that all these are cases of new inventions, and for these my law may be valid. "Later improvements may not increase production in the same ratio as earlier ones: the second doubling of a thing that has already been doubled is always harder than the first." But my theory is supposed to assume that this same tendency towards diminishing product holds good in the application of old inventions also. Now, the ordinary investor of capital, as distinguished from the inventor, of course finds only such processes available as are already known; and for him Professor Macvane finds that my law is not sufficiently verified in practical experience.

I do not believe that Professor Macvane has taken a happy step in endeavoring to distinguish, for the subject here under consideration, between old and new inventions.

For the old methods and inventions are precisely those which a short time ago were new. At the earlier date it was not possible to double the product by their aid, and this can be no more easily done at a later date, if in the interval the only change has been that the method which could not affect the doubling has simply become "old." The situation is simply this. Every method to secure a particular product was once upon a time new. For instance, let us place ourselves in imagination at the period when the third method of our diagram, with its two-year period of production, was new. This method made possible a yearly product per laborer of 450; and, in comparison with the one-year period which had yielded a yearly product of 350, it shows an increase of 100. At that time, therefore, every person who was able to make advances of capital to his laborers over two years instead of over one year — in other words, who could increase his investment of capital by the advances needed for one further year — could thereby secure an increase of product of 100. A short time later the fourth method became new. That method made possible a yearly product of 530, bringing an increase of 80 as compared with the two-year method. Whoever was then in a position to increase his investment of capital by the advances of a still further year could get from the additional investment the diminished increase of 80. It may be remarked, incidentally, that it is by no means a matter of course, is not even probable, that every producer is in the position so to increase his investment. The discovery of a new and advantageous, though longer, method of production does not necessarily lead to immediate general abandonment of the less advantageous and shorter method. The knowledge of the existence of the better and newer ways can lead to their actual use only in so far as the successive accumulations of capital make this in practice possible.

What, now, is the situation, if we assume that each of

these methods, once new, has become "old," and thus has become available for every investor, nothing else having changed? It is very simple. All the methods discovered up to the present moment constitute the répertoire within which the ordinary investor can choose, not only according to his insight, but according to the quantity of capital which is at his disposal. If he chooses — perhaps because his means permit not being more — the one-year method, then that method will yield to him now, as before, a product of but 350. If he adopts the two-year method, now, as before, he will get 450; with the three-year method, 530. In other words, if the person who from lack of capital had to produce in former years on the one-year plan can increase his investment of capital, he will be enabled by this now "old" invention to get with an additional year's capital an increase of 100, but with the next year's supply not a further increase of 100, but only an increase of 80. Even as matters stand at present, he cannot, by simply increasing the investment of capital, always get a corresponding increase of product. The rate of increase begins to diminish at some point or other, and it is immaterial whether the method of production in which the additional capital seeks and finds its investment has been recently discovered or has been already known for a longer or shorter time.

It is possible that Professor Macvane has been led into confusion because he has conceived the introduction of all methods of production pertinent to this case as being in the nature of "inventions." Doubtless it is true that every step in production, however slight may be the change it brings about, must at one time or other have been a discovery, and must thus have constituted an "invention." But we usually understand by that term a very considerable innovation, based on some unusual exercise of ingenuity and much excelling what has preceded. Such is sometimes the course of events with new

roundabout methods, but by no means always or even frequently. In many cases the new variation is not a noteworthy invention, but a very obvious combination of known elements; as, for example, in the simple transference of certain improvements or implements, already familiar in some branches, to other branches to which they have not yet been applied. It follows that the difference in the productiveness of new as compared with old methods does not usually proceed by such leaps as has been assumed in our figures. The change is often so slight that the gain in the quantity of product does not offset the disadvantage of the longer process; and the longer method does not become in fact profitable until a later date, when perhaps a decline in the rate of interest removes the pecuniary disadvantage of the longer method. Further, it is not to be supposed that the methods which entail a more circuitous route are always those of latest discovery. As I have already remarked in my reply to Mr. White, the course of events is often the reverse; and very often it happens that, when a real discovery suddenly presents the possibility of using a considerable series of different lengthened methods of production, the order in which they shall severally be used depends not upon the order in which they are discovered, but simply upon the possession of a larger or smaller supply of capital. If, for example, some one discovers to-day a new chemical method for producing aluminum, he will also know that the construction of the factory, boilers, machinery, and what not, can be arranged on a dozen different plans, which correspond to as many variations in the quantity of capital invested and in the length of the period of production. Thus the main discovery brings with it the "discovery" of a dozen modes of proceeding, involving different lengths in the period of production for aluminum.

Professor Macvane in one paragraph expresses his suspi-

cion that the law of the diminishing rate of increase, which I have set forth, may be the same thing as the familiar doctrine of diminishing returns from natural agents. I do not believe this to be the case. The law which I have laid down has a very different content from that of the law of diminishing returns from land. The latter declares that, even though more labor, direct or indirect, be applied to a given area of soil, the later application of labor will yield a smaller product than the earlier. My law declares that, if the same quantity of labor, but spread over more time, is applied in any branch of production (not merely in agricultural production), the greater length of time will indeed, as a rule, bring a larger product, but in the later extensions a less increase of product than in the earlier.

This essential difference between the two propositions has not been overlooked by Professor Macvane; but his suspicions are aroused by the belief that, as to those parts of my thesis in which it is of wider application than the law of diminishing returns from land, no sufficient proof from experience can be adduced. Let me admit at once that at present an exact statistical proof in figures cannot be given, and this for two reasons. In the first place, statistical science as yet has given no attention to speculations of this sort. Secondly, that numerical quantity, which I have called the "duration of the period of production," is, in any case, almost impossible to determine with accuracy. For the period of production, in my sense, extends over the whole mass of preparatory acts necessary for producing a commodity,—acts which under the division of labor are split between dozens and hundreds of establishments, between the most different persons, and are spread over the most various lengths of time. The exact ascertainment and addition of all these fragments of time and labor, the comparison of the result with the increase of product (which shows itself in the same

manner in dozens and hundreds of fragments), are practically almost impossible.

Of course, the circumstance that an exact numerical measure of the length of the period, and of its influence on the quantitative product, is difficult or even impossible, does not negative either the reality of the relation which is set forth nor prove any impossibility of ascertaining some approximate regularities or rough tendencies. In the days when thermometers had not been invented, and when the numerical statement of differences of heat was not possible, not only did changes in the quantity of heat have their substantial importance, but the explanation of certain tendencies in the movement of heat was perfectly possible. It could be laid down that the warmth of the air increased daily from morning until after mid-day, that it increased annually from winter to summer, and so forth.* In the same way, I believe that, notwithstanding the impossibility, in the present state of our knowledge, of getting any numerically exact statement, general experience suffices to verify inductively my law of the diminishing increase of productiveness with the extension of the period.

In fact, the length of the period of production, while it cannot be directly measured, is reflected very closely in another dimension which can be measured: namely, the amount of capital which must be invested for each laborer, in order to equip him with the results of the preparatory labor of the previous stages. Thus in one and the same

*I have encountered, not in the criticisms of Professor Macvane, but in those of some German writers, the curious opinion that dimensions which cannot be measured in practice must therefore be devoid of significance for scientific purposes. This sort of reasoning has been applied to my application of the conception of a period of production. It has also been applied to the whole modern theory of final utility, in so far as that theory bases value upon degrees of intensity in pleasure and pain, which also are not susceptible of exact measurement. This objection seems to me to have no more foundation than it would have to say that, had thermometers never been invented, heat never could have been in quantitative relation to other phenomena, *e.g.*, the volume of heated bodies!

branch of production — as, for example, in turning — the laborer can be supplied either with a primitive lathe worth five dollars or with ingenious and complicated machines worth fifty, five hundred, five thousand dollars. Now, I believe that industrial experience will verify two propositions, perhaps only in the rough, but, nevertheless, with sufficient exactness: first, that, with the larger capitalistic equipment, the product per unit of labor increases; and, second, that this increase in the product does not go on *pari passu* with the addition of capitalistic equipment. Thus, if there are two laborers, one having no capital, the second with a capital of fifty dollars, the difference between their product will be absolutely and relatively greater than that between two laborers, one of whom has a capital of five thousand dollars, and the other has a capital of five thousand and fifty dollars. If the first proposition be admitted and the second one denied, it would follow that, in the words of the German proverb, our industrial trees can grow all the way to the sky,— a thesis which certainly is not confirmed by experience, and which is against all the probabilities of the case. Professor Macvane himself points out that it is more difficult to double something which has already been doubled. If this be true, as Professor Macvane is disposed to admit even for new inventions of the future, it must be so much the more true for people who are not inventors, but who are simply walking in the beaten track of the application of the traditional methods.

I may add that it is my hope and wish that the actual relations which obtain in concrete industry may be investigated by persons who have those qualifications for the inquiry which Professor Macvane modestly disclaims. Such would be persons who combine practical knowledge of the methods of industry with the capacity for scientific generalization. I may take it as a circumstance at least favorable to my view that Mr. William Smart, the excel-

lent translator of my book, whose earlier experience as a man of affairs gives him this double qualification, has found no occasion to question my law.

So much as to the first point of difference between us. But I have further assumed that the capitalist, in determining which he should use among the various methods available in the existing state of industrial knowledge, would find the rate of wages a factor of essential importance. If the rate of wages be low, one of the known methods of production may be the more lucrative: if it be high, another.* Much to my surprise, Professor Macvane has questioned this assumption of mine also, and has presented in opposition to it an emphatic opinion of his own. He says: —

"I have been accustomed to suppose that in any given state of our industrial knowledge there is a best way of setting about the production of every commodity,— *one* way that gives larger product for a given outlay of labor and waiting than any other. This way I have supposed to be best for all concerned, *quite regardless of the rate of wages*,— best, because it is the way of least cost. The method of production that gives each commodity at lowest cost I have supposed especially to be *the one best for the employers*, quite regardless of the rate of wages. And this I have taken to be the common belief among practical business men as well as among economists. . . . Neither is it clear to me how changes in wages could alter the interest of the employer in the choice of methods." †

I believe it is not difficult to make this clear. Let us take any practical example. A farmer considers whether it is worth while to buy a piece of agricultural machinery, which will save him, say, the labor of ten laborers for a year. Let us suppose that the machine costs $10,000, lasts ten years, and costs $4,000 a year to run. Now, the financial calculation of the farmer will be as follows: The machine costs him each year in running expenses $4,000, in wear and tear $1,000, in interest $400,— total, $5,400.

* *Positive Theory of Capital*, p. 388, *seq.*

† See this *Journal*, vol. v. p. 36. The Italics in the quotation are mine.

If, now, the rate of wages is $500 a year, the ten laborers he is enabled to dispense with by means of the machine will cost him only $5,000. In this case it will be clearly to his advantage to retain the less capitalistic method, and to apply direct human labor. If, now, the rate of wages is $600, the ten laborers will cost him $6,000; and in this case it would be clearly to his advantage to enter on the more capitalistic method, to select the roundabout way of making or buying the machine.*

This example, which could be varied or modified *ad libitum*, makes it clear, I believe, that the rate of wages is a factor of decisive importance in determining which method of production shall be under given circumstances the most advantageous. I venture, moreover, to assert that this opinion, and not its opposite, represents the "common belief" among practical business men as well as among economists. I believe that all business men know that, the lower the rate of wages, the less is it in the interest of the employer to replace labor with fixed capital; while, on the other hand, a high rate of wages stimulates the introduction of labor-saving machinery. This proposition is equally familiar in economic theory. I did not in the least suppose that I was here presenting new doctrine, but was simply stating in somewhat general terms what is to be found in other German books on political economy, as, for instance, in Roscher's. I should be much surprised

*If the high rate of wages held good, not only for agricultural laborers, but for all laborers, the figures in our illustration would be changed, but the final result would be the same. It is true that in this case the investment of capital would be correspondingly increased, so far as that part is concerned which resolves itself into wages. The price of the machine, in other words, would be something more than $10,000, and the running expenses would be something more than $4,000, but only a part of the investment of the total outlay for capital resolves itself into wages. Another part is interest. Hence the increase in the expense of the more capitalistic method would always be less than in the case of the direct employment of laborers. Consequently, with each increase of wages the tendency would be the same as in the illustration given in the text, even though it would proceed at a slower rate. A rise in wages shifts the point of profitable use, to the advantage of the more capitalistic method.

if the same thing were not found in English books on our subject.

Lastly, I wish to say a word on a point which stands midway between the theory of capital and the theory of value. Professor Macvane finds it blameworthy that I have made the problem of capital a case of value; more particularly, that I have spoken of the value of future goods, and have made the increase in their value, as they come nearer the present, a factor in the explanation of interest. He says: "To speak of the value of commodities that are not yet in existence is to employ a mere figure of speech. To speak of their value increasing as they approach existence, and to represent this increase of value as a source of profits of employers, seems little short of indulging in merely fanciful language." *

We have a German proverb to the effect that the blade which is too sharp has a ragged edge. I believe the proverb has its application to this argument of Professor Macvane's. He carries scepticism too far. Professor Macvane would be in the right if value were a physical attribute of a commodity, like its weight, density, color. In that case a commodity which did not exist of course could have no value. But value, at least as we Austrian economists have always conceived it and explained it, is a psychical and subjective phenomenon. The valuation of a commodity means simply that a subject, a man, considers whether the commodity has an importance for his welfare, and how much importance. Now, valuations of this sort men do make, without discrimination as to whether the commodities are physically present or physically absent, and as to commodities which are now present or will appear in the future; and they take action under the influence of such valuations. It is a simple fact that, as a rule, men ascribe to a commodity which is to come into existence, or to be at their disposal, only after the lapse of ten years, a less importance than they ascribe to

* *Loc. cit.*, p. 43.

the same commodity on hand at the moment. It is a further fact that men change this estimate in proportion as the period which intervenes before the commodity is at their disposal becomes less. It is finally a fact that concrete dealings are carried on in regard to commodities which do not exist, as, for instance, wheat in the ear. If, now, having in mind facts of this sort, I speak of the value of future goods, and of an increase in their value, I believe I use phraseology which is appropriate for completely real phenomena, and by no means move in the sphere of things fanciful and beyond the domain of science.

No critic is so severe in his judgment of my work as Mr. Frederick B. Hawley. Nevertheless, I shall say but little in reply to him, because of a circumstance in his criticism which probably will serve to lessen the interest of most readers in it. Mr. Hawley has used in the title of his essay the phrase *Kapital und Kapitalzins*,* and by this title and by his concluding remarks has indicated that his criticism is directed to my entire work. Yet, unless I am much mistaken, Mr. Hawley, when he wrote his criticism, had not read the second volume. Otherwise Mr. Hawley could not possibly have said of my treatment of the element of time, which runs through several hundred pages in the second volume, that "it is here and there in Professor Böhm-Bawerk's treatise somewhat *darkly hinted* that this explanation is to be found in the element of time." This, too, explains the complete absence of quotations from the second volume. In the only passage in which Mr. Hawley refers to the contents of the second volume, he quotes only from the

* *The Fundamental Error of "Kapital und Kapitalzins,"* in this *Journal*, vol. vi., No. 3, April, 1892. In the German edition of my book this is the title of the whole work, both for the first volume, which is entitled *Geschichte und Kritik der Kapitalzins-Theorien*, and for the second volume, entitled *Positiv Theorie des Kapitals* The English translation of the second volume was published in the latter part of 1891.

summary which the translator had prefixed to the first volume. I cannot in any other way explain misconceptions on various points which I had touched but briefly in the first volume, but discussed at length in the second. Any reply that I should now make would have to take the form of a somewhat wearisome repetition of things which in the mean while have become familiar to the readers of this journal, and, perhaps, to Mr. Hawley himself.

Yet I must say, in self-defence, that Mr. Hawley has greatly misconceived the contents even of the first volume. His main objection to my theory rests simply upon a misconception. The "fundamental error" of my book he finds in the circumstance that I confound interest and profit. More particularly, I am accused of confounding the popular with the scientific conception of interest. What is called in every-day life interest is said to consist of three different constituent elements; namely, pure interest, the reward for risk, and the reward for personal efforts in investigating credits and placing loans, this last being a form of wages of management. Mr. Hawley says that I treat all this as pure interest. The assertion is inexplicable to me. It is not possible to speak with greater clearness and precision upon this point than I have done,—for instance, on pages 245–247 and on page 412 of my *Positive Theory;* and, even if Mr. Hawley had not then read the second volume, the same thing may be found at page 7 of the first volume. I will not, therefore, enter on any further reply, but will only note that Mr. Hawley on his part finds the solution of the problem of interest in a combination of the abstinence theory, the productivity theory, and the use theory. Each of these is supposed to contain a certain amount of truth; and, "taken together, they afford a full explanation of the phenomena of interest." I, for my part, regret that I cannot accept this view.

E. BÖHM-BAWERK.