to these tracts? This will depreciate the values of surrounding lands and enable the Government to obtain them at lower prices. The zone of depreciation will widen and deepen until the unpurchased land could be obtained for a song. By this time interest would have disappeared and the interest-bearing bonds could be replaced by non-interest bearing bonds. These could be paid so slowly that no great burden would rest upon future generations. We would in this way get the support of many over-conscientious people who accept the Single Tax theory but who stick on compensation, and we would soon be enjoying most of the benefits of the Single Tax.

Suppose, for instance, that the United States Government should invest $25,000,000 in anthracite coal lands, buying about 10,000 acres, or one-tenth of all, and, fixing a royalty of 50 cents per ton, with a minimum royalty of $100 per acre, should throw these mines open, in small tracts, to the public. What would happen? Coal is mined for less than $1 a ton. Add 50 cents for royalty and 50 cents for transportation. (The Government buying a railroad, if it could not compel reasonable rates), and hard coal could be sold at $2.50 or $3. a ton in New York. What a drop there would be in the prices of anthracite lands and anthracite railroad stocks. Not only would the bottom fall out of the trust, but the next 10,000 acres could be purchased at knock-down prices. In this case the royalty from coal mines would fully reimburse the Government for its outlay. The object lesson to Pennsylvania and other states would result in numerous similar purchases and treatment of other lands. The days of industrial slavery would soon be gone. The dawn of all kinds of freedom would be at hand.

WASHINGTON, D. C.

BY RABBI J. L. STERN.*

"All material existence is in space and time. Hence the production of wealth, which in all its modes, consists in the bringing about by human exertion of changes in the place or relation of material things so as to fit them for the satisfaction of human desires, involves both space and time." (Henry George, The Science of Political Economy, Book III, Chapter V, § 3).

Space and time are, naturally, also involved in the distribution of wealth. The simplest case imaginable of the problem of the distribution of wealth is that where an individual labors absolutely unaided by society, by other individuals. In such a case the entire produce is the wages of the laborer. Such cases are, of course, rare; indeed, barely possible. A Robinson Crusoe stranded naked upon an uninhabited island without a nearby wreck from which to draw capital presents such a case.

But when men live, as they ordinarily do live, in society the efficiency of their exertion becomes enhanced and the produce of the labor of the individual worker will be larger than it would be without society. Part of this increase due to the proximity of society cannot be identified and goes to the laborer in enhanced wages. Other parts of the increase can be identified as due to particular causes and are then no longer included in wages.

These causes are superior space relations and superior time relations, either or both of which may aid the individual to produce more than he could

* This article of the Rev. J. L. Stern, received since the editorial note on page 1 was written, seems further to reinforce the agreement to which the contributors to this symposium seem tending—namely, the acceptance of *the time element* both as the origin and justification of interest. If this theory be accepted, it carries with it an affirmative answer to the inquiry as to whether interest will persist under the Single Tax. But it does not prove that interest will be maintained at present rates. Under normal conditions and with the abolition of the usury laws (to which it is to be regretted that none of our contributors have made allusion) it seems almost certain that interest will continue to fall.—THE EDITOR.

produce without them. The enhancement of the product obtained by superior space relations is rent. The enhancement of the product due to superior time relations is interest. With the former, rent, we are not concerned here.

Henry George (Progress and Poverty, Book III, Chapter III) refers to the time element in production as the cause of interest. But he does so only secondarily in connection with, what he states, as the origin of interest, namely: "The power of increase which the reproductive forces of nature, and the in effect analogous capacity for exchange, gives capital." In these cases Henry George holds that the product is not solely due to the amount of labor expended but it depends also on "the amount of capital and the time it is in use." Thus interest is accounted for in the case of two of the three modes of production, growing and exchanging, and is transferred to the third (first in order of enumeration by H. G.) by the fact that all wealth—capital included—is interchangeable.

Reflection will show that "the amount of capital and the time it is in use" play a direct part in adapting as well as in growing and exchanging. On my desk stands a little clock which told me the time of day. This morning it awakened me. I had not touched it since the preceding midnight when I wound it up and brought it to my bedroom. There was no actual increase such as we find in the growing corn, nor increase of value as in the age-mellowing wine or in a trader's stock that was carried from one country to the other, but there was a service which has value and which was being rendered throughout the twenty-four hours of the day although my labor was performed in a minute. The elasticity of the main spring is as much a part of the active power of nature as is the power of growth in the seed corn. In short, Henry George's statement, which he makes in reference to growing only, is true of all production: "There are, so to speak, in the movements which make up the everlasting flux of nature, certain vital currents, which will, if we use them, aid us with a force independent of our own efforts, in turning matter into the forms we desire—that is to say, into wealth." (Ibid. § 17).

All production of wealth, no matter how simple or how refined be the result aimed at, consists in the putting of matter into forms and places we desire. The changes of place and form are brought about by the utilization of the so-called powers of nature. The actual work done by man, "our own efforts" of Henry George's quotation, are of the very simplest. Man can move matter from place to place, strike, rub, grind matter against matter, break matter held together by cohesion or adhesion, and that is about all. The powers of nature do the rest. I say: "I am going to make a fire"—what I am really doing is to place paper, wood and coal in the proper position, to rub a match against sand-paper and to place the inflamed match to the paper. "My own effort" consists in the moving to and fro of different portions of matter. The real work is performed by the powers of nature. Gravitation held the combustibles in place, the heat generated by the rubbing of the match against a rough surface caused the phosphorus on the match tip to unite chemically with the oxygen of the air, thereby more heat was generated, sufficient to ignite the sulphur and the wood, the gases of combustion formed a flame which was hot enough to ignite the paper, etc., etc.

A chemist drops some powder into a vial containing a liquid, the materials react upon one another and new chemical combinations are formed—maybe a new dye has been produced. A horticulturist puts the pollen of one flower on the pistil of another, and a new variety of bloom or fruit is the result. In the former case no less than in the latter, which is a case of growing, the vital powers of nature supplement the simple human work of moving matter from one place to another.

The point I wish to make is that in all production of wealth the powers of

nature more than supplement the human effort, working independently of the latter, though directed by it, no less in adapting than in exchanging and growing. [Perhaps we may classify the energies playing a role in adapting as physical and chemical, in growing as biological or physiological, and in exchanging as physical (transportation) and psychological and sociological (human desire).]

Now the actions and reactions of the forces of nature consume time whether they be the vital forces involved in growing, or the others which come into play in other modes of production. The lapse of time may be longer, and, therefore, more apparent in the case of growing and exchanging, but it is present also in adapting. In some cases it is even there quite extended. For instance, in the production of salt by natural evaporation out of lake or sea water which is made to fill broad but shallow basins, as is done on the shores of the Great Salt Lake in Utah and on the coasts of the sea in Southern France, Spain, Portugal, Italy and Austria. The older methods of tanning and of bleaching are also instances.

In a very limited degree the natural forces can be utilized without capital. One may build a hut with stones and sticks and clay picked up with the hands. Gravitation will hold the materials in their places, the heat of the sun will dry the clay and adhesion will aid gravitation in making a sort of a house. An Esquimo's ice and snow house may be similarly made. But to obtain better results capital is needed. To make the wind pump our water requires a windmill. To utilize the energy contained in coal, in the expansive force of steam, the gravitational force of a Niagara, the subtle and potent currents of electricity presuppose elaborate machinery, capital. Here an additional time element becomes apparent, one greater in amount than that presented by the fact that the forces of nature require time to act. The accumulation of capital also requires time. If by borrowing I get the use of capital prior to the time which it would take me to accumulate it, I get a time advantage. *Interest is the premium paid for superior time advantage, just as rent is the premium from superior space advantage.*

Henry George has shown how in growing and exchanging capital enables us to take advantage of time. In adapting, too, all that is gained by the use of capital is time. Bastiat's carpenter, James, makes with his plane three hundred boards in a year. By the aid of a sawmill he can make them in a day. It would extend this paper beyond the limits ascribed to it to multiply examples. But let the reader take up any case of adapting, it will be found that the employment of capital means a gain of time. When we speak of labor-saving machinery we are meaning time-saving machinery.

If a certain amount of labor applied without capital upon land (the space element of production) can produce in a given time a result equal to ten units, while the same labor applied upon the same land but employing capital for the purpose of utilizing to better advantage the forces of nature (the time element of production) produces eleven units, then clearly the surplus unit produced in the second case is due to the use of capital. If capital were like land, absolutely indispensable to production, and if it were like land absolutely limited in quantity then the law of interest would be analogous to the law of rent, namely:

The interest of capital is determined by the excess of produce which its employment insures over that which the same application can secure by the employment of the least productive capital in use.

But capital is not absolutely indispensable as is land, though it is in civilized society nearly so; its amount on the other hand is not limited at all. The law of interest as above stated is, therefore, true as far as the capital is concerned, but not as concerns the lender. To recur to Bastiat's (and George's) car-

penter, James. If he saves or can borrow enough capital to replace his plane by a steam planing mill the excess of his produce from it over his produce while working with the hand plane is the earning of his capital, is his interest. But the lender cannot get all that excess. For the reward of capital in use being large, a surplus of capital is always produced. Capital seeking borrowers is thus in a position similar to that of labor seeking employment where land is monopolized and, therefore, opportunities to labor restricted. The produce which is the natural wages of labor plus natural rent * is not less there than where land is free, nevertheless the wages actually obtainable by labor under those circumstances tend to a minimum because land obtains in monopoly rent a part—often the greater part—of what ought properly to be wages. Thus capital seeking employment where opportunities for the employment of capital are restricted. The advantage of the use under such circumstances of capital is not less by reason of the fact that much capital is unemployed, but the lender does not obtain this entire advantage, and in certain cases the user also will not obtain the full benefit of the advantage of the use of capital, though he will in other cases.

The circumstances of more capital seeking employment than there are open opportunities for its employment is due in civilized society mainly to two causes. The first one of these is, of course, the same as that which produces an analogous situation for labor, namely, land monopoly. Capital being employed by labor, its employment fails concurrently with that of labor, And as in this case part of the natural wages are absorbed by monopoly rent, so also is part of interest, both as concerns the lender and the user, absorbed by monopoly rent.

The second cause involves circumstances the reverse of those of the first. Under free land, that is, where land monopoly is absolutely abolished, under the Single Tax system, the general and equitable distribution of wealth means a general distribution of capital. It is possible—nay probable in the highest degree—that in such a world labor, the user of capital, will nearly always possess enough and often more capital than is needed. In this case the user of capital will get the full benefit of its use. But the returns to the lender will tend to a minimum ; because there will be very few borrowers, and very many that have surplus capital to lend.

I present these considerations on interest to students of the science of political economy with some diffidence. Not that I doubt their correctness, but because it was necessary in making them to subject the work of the creator of the science to some criticism. But it is apparent that Henry George himself had some doubts whether what he said on interest was the final word on the subject ; his expression: " And *it seems to me* that it is this which is the cause of interest," (Progress and Poverty, Book III, Chapter III, § 17) has a note of uncertainty in it. It was this note, so unusual in his writings, that led me long ago to analyze the chapters in question, and it was from his beautiful chapters on Space and Time in " The Science of Political Economy " that I was first led to what I feel is the true explanation of the cause of interest.

CUMBERLAND, MD.

BY DR. S. SOLIS COHEN.

I notice in the Autumn number of the REVIEW, just at hand, an article on interest, by Faidy, which ascribes to a couple of modern writers the discovery that interest is based upon ground rent. If you will look up Michaelis' " On

* By natural rent I mean economic rent under absolutely free circumstances such as will obtain under the Single Tax system.