A Contribution to Economic Theory, Constructed upon Basic Assumptions Respecting the Existence of the Human Species in the Universe

Table of Contents:

A Contribution to Economic Theory, Constructed upon Basic Assumptions Respecting the Existence of the Human Species in the Universe

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The purpose of this preliminary report is to contribute something of value in the short term to persons currently engaged in considerations of the needed changes in US economic and financial policy, considerations which are becoming more pressing by the day given the economic emergency in which the US is now mired, in addition to the spectres of those more profound crises yet to come if effective action is not taken soon. The impetus for the creation of this report arose from a desire to better understand the proposal made by Lyndon LaRouche to implement "Four laws to save the United States."

Introduction

Something is clearly wrong with the US economy, as indicated by the collapse of industry, infrastructure, income, life expectancy, education, hope, general sanity, and so on. Something is clearly wrong with the US financial system, as indicated by the trillions of dollars in recent and continuing bailouts, massive increases in stock indices without any corresponding increase in economic productivity, the looming threat of another financial crisis, the grotesque increases of profits of financial institutions and their executives while real incomes continue to decline for the majority of Americans, and so on.

While these two problems -that of the economy, and that of the financial system- are readily recognized individually, the *relation* of these two problems is more obscure. This is because the relation of economic processes and financial processes, in general, is obscure. Indeed, many persons are not even able to distinguish between economic and financial processes such that they could even consider the question as to how these processes are interrelated.

Lyndon LaRouche has proposed "Four Laws" to save the United States' economy. The first two of these four laws are financial measures; the last two are economic measures. Thus, a deeper understanding as to why these four laws -two financial and two economic- are necessary to the saving of the US economy requires an understanding as to how financial and economic processes are related generally, what specific relation these processes exhibit in the US economy at present, and what specific relation they should exhibit in order to avoid the perpetuation of unnecessary misery arising as necessary consequences of the faulty system currently in place. This report is intended to clarify these matters by presenting an argument in economic theory for what should be considered the legitimate use of money and credit.

I. The Economic Process

Man In the Universe

It should be recalled that every individual human being, and thus the human species, exists in the universe. It so happens that the nature of the universe in which the human being and the human species exists is such that each individual human is required to use, or *consume*, certain things in order to continue to exist. Further, the universe is of such a nature that the things which the human being requires to consume for its existence are not procurable except by *labor*. Thus, the short-term and the long-term existence (extended biological reproduction) of the human species cannot occur but by the labor of its individual members in the procurement of what is needed to be consumed for their continued existence in the universe. Anything that is consumed by a member of the human species is made possible only by physical labor performed either by that individual, by other individuals of the human species, or by a combination of the two. Any collection of individuals which perform physical labor, the fruits of which are interchanged amongst themselves in some way, can be called a *society*, or, an *economy*.

This considered, we define economics thus: *The science the subject of which is the perpetuation of the existence of the human species*.

Thus, initially, we may be inclined to conclude that the labor of the individual in a society is subject to classification in one of two categories: 1.) Labor which provides the basis for, or results in, consumption which facilitates the survival of the human species in the physical universe. This is called *productive labor*; 2.) Labor which results in consumption which has either no functional/causal connection -or is inhibitive- to the survival of the human species in the physical universe. This is called *non-productive labor*.

Despite that the concepts of consumption and labor seem distinguishable, we find, upon consideration of that distinction, that labor and consumption are really the same thing. For, based on the way in which the universe seems to operate in accordance with the principle that “nothing comes from nothing", we understand that every act of physical labor is also an act of consumption. For the act of labor itself can only take place if something else is consumed in the process. Similarly, the consumption of something only occurs if labor is performed to consume (as when we exert labor to eat, or when we exert labor to use and wear down -i.e. consume- some article). Thus labor is consumption and consumption is labor. But, the distinction between the two kinds of labor/consumption is still valid- either it occurs as *productive* in that it causally contributes to the continuation of the existence of the human species; or, it is *non-productive*, in that it has no such functional connection. Given this, one cannot help but reflect that every breath that we take, every motion we make, every thought we think, is consumption, and we cannot but be haunted by the question as to whether we will ensure that that consumption occurs in the mode of productive action, or whether it shall be known to all time as waste.

Setting aside the terms “labor” and “consumption", we may define “productive *action*” as that which causally contributes to, or augments, the perpetuation of the existence of the human

species in the universe. On the other hand, we may define "non-productive action" as that which does not causally contribute, or is positively inhibitive, to the perpetuation of the human species in the universe.

By the elaboration of these initial premises under considerations of the essential characteristics of the human condition, the most important features of economic processes can be identified. By identifying such features, the basis is laid by which the economic impact of monetary and financial processes can be analyzed.

II. Establishing Metrics

Now that the definitions respecting some of the most important concepts in economics have been given, the question arises as to how we might establish a capability to compare, or measure, the things referred to in those definitions in order to render the terms so defined susceptible to the kinds of rational considerations which precede deeper understanding.

A Brief Note on Magnitudes and Metrics in Science

To illustrate the kind of magnitudes which will be utilized as the metrics in our elaboration, a brief note is here made. In theoretical science, there are various kinds of measurements which are made. The first is the actual empirical measures made by observation- when two distinct magnitudes in our experience are compared to each other. Generally, visual magnitudes serve this purpose. The second is the indirect measurement of a magnitude which we assume to exist in reality[1]. The way in which the second kind of measurement is carried out is by logically applying the theories about reality which we entertain to the numerical values obtained in measurements of the first type. Sometimes, the second kind of measurement is performed on magnitudes which could have been measured in the first way described. Sometimes, the second kind of measurement is performed on magnitudes which are not capable of being measured in the first way described. Thus, a magnitude which is measured in the second fashion described is theoretical until it is directly measured; but if the magnitude is not capable, in principle, of being directly measured, it cannot escape the status it has a theoretical magnitude.

When we conceive of any hypothetical physical system, the magnitudes present in the system are inherent in the notions used to construct the system. For example: The hypothetical system of empty space with x number of particles, each with a given relative motion and position operating under a mathematically defined force of gravity. This system will have a total kinetic energy and gravitational potential energy. We do not need to actually measure these values because they are inherent in our construction of the hypothetical system itself. However, the values of these magnitudes can be measured, in either the first or second way described above, in actual empirical situations which approximate such a hypothetical system of idealizations.

[1] Or, depending upon your epistemological inclination, an imagined magnitude which we admit is practically useful to assume as existing in reality.

In what follows, we will make use of such kinds of hypothetical magnitudes as have been found to be the most appropriate to the empirical aspects of human existence, and to extrapolation into the theoretical considerations of human society. These magnitudes will serve as the metrics of a number of important terms which arise in the following study of economics.

Existence

As we have defined "economics" and "productive action" in reference to the perpetuation of the existence of the human species, the first metrics to be established are those which can be correlated with the *existence* of the human species. What measurements correspond to the existence of the human species? In other words: What measurement would we make in order to determine whether one specific action contributed to the existence of mankind more than another specific action? Or, reformulated in accordance with our definitions: What measurement would we make in order to determine whether one action was more productive than another action?

The Individual

In the hypothetical case of an isolated individual existing in the universe, the "measure" of that individual's existence seems to be a straightforward matter: it is nothing other than the lifespan of that individual. Thus, the comparison, or measure, of that isolated individual's productive action, to that of another isolated person's, would be made by comparing the magnitudes of time over which they existed- their lifespans (at least under certain conditions).

For example: Imagine that there exist two remote and uninhabited islands of absolutely identical environmental characteristics. Now, imagine that there are two biological twins of identical age, physiological characteristics, and desire to exist. Imagine that each twin is placed alone on each island, perhaps as a result of an unfortunate shipwreck. In accordance with our definition of productive action as that which perpetuates the existence of man in the universe, there might be made a comparison of the magnitude of productive action of the two twins by comparing the amount of time each one was able to survive on their respective island. If one twin were able to survive longer than the other twin, we could say that the magnitude of that twin's productive action was greater than that of the other who lived shorter.

But we are interested not in such hypothetical isolated individuals, but, rather, in societies, or economies, and, thus, we require measures which correspond to the existence of mankind as expressed in a society.

Society

-Average Lifespan
Imagine two land masses of identical size and environmental conditions. Two large groups of people, the physiological profiles of which are identical, are then each placed on each of these land masses. After a certain amount of time, it is found that the individuals on one landmass achieve longer lifespans than those on the other. Average lifespan providing a seemingly reliable way of figuring the degree to which human existence in the universe is being perpetuated by a

society, we would be inclined to conclude that the difference in the average lifespan attained by two societies would be the measure of the difference in the amount of productive action performed in those societies.

However, unlike the case of the hypothetical isolated individual, this measure is not sufficient for our purposes, as will be made clear by consideration of another measurable aspect of society which is found to correspond, with equal appropriateness, to our initial definition of productive action.

-Population Density
Return to the example of our two identical finite landmasses, each populated with an equally large group of people physiologically identical to each other. Imagine that, for a certain interval of time, both groups grow in numbers to a certain extent, but, after a certain point, cease to do so and achieve a state of semi-stable population level under a quasi-equilibrium with their respective environments.What if, then, we were to examine the number of individuals on each landmass, and find that one group had a larger population than the other group? The population density providing a seemingly reliable way of figuring the degree to which human existence in the universe is being perpetuated by a society, we would be inclined to conclude that the difference in the population density attained by two societies would be a measure of the difference in the amount of productive action performed in those societies.

We thus find that two different measures seem equally appropriate for measuring human existence and providing the metric for a society's amount of productive action: Average Lifespan, and Population Density. In an attempt to reconcile the two, consider the following:

In the first hypothetical case, in which the average lifespan of one group was higher than that of the other, the possibility was ignored that the group with lower average lifespan could have much more people in it, and a much higher population density. Similarly, in the second hypothetical case, in which the population density of one group was higher than the other, the possibility that the group with lower population density might have higher average lifespan, perhaps resulting from better "standards of living." was ignored. From this, one might say that it was tacitly assumed that the lifespan and the population density both acted as *perfect* measures of the amount of productive action of society. If we were to assume that both measures are valid measures, and that they were perfect measures, we would necessarily admit that the two measures would always change in some definite proportion to each other as the amount of productive action in a society were changed. But, it is easily demonstrated that this is not the case.

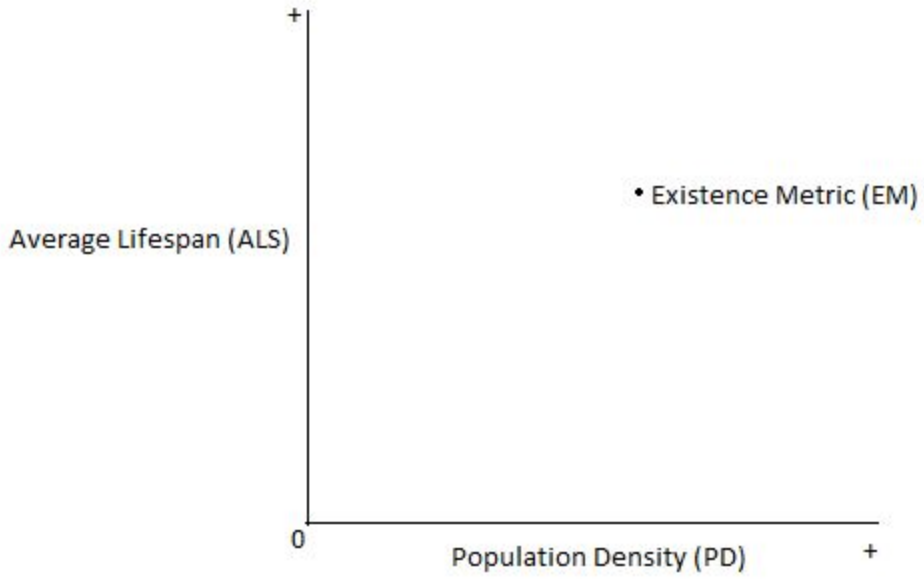
It is evident that a society, at a given point in time under given conditions, will have a certain average lifespan and population density. For example, a society might achieve a level of average lifespan of 70 years, and a level of population density of 1000 persons per square kilometer. But, it is also evident that that same society could, to a certain extent, modify those levels by increasing one measure at the expense of the other. For example, the hypothetical society just mentioned might change their mode of behavior in the universe such that their average lifespan decreased to 68 years, while their population density increased to 1100 persons per square

kilometer. Conversely, the society might increase its average lifespan, while lowering its population density.

The "Existence Metric" of a Society

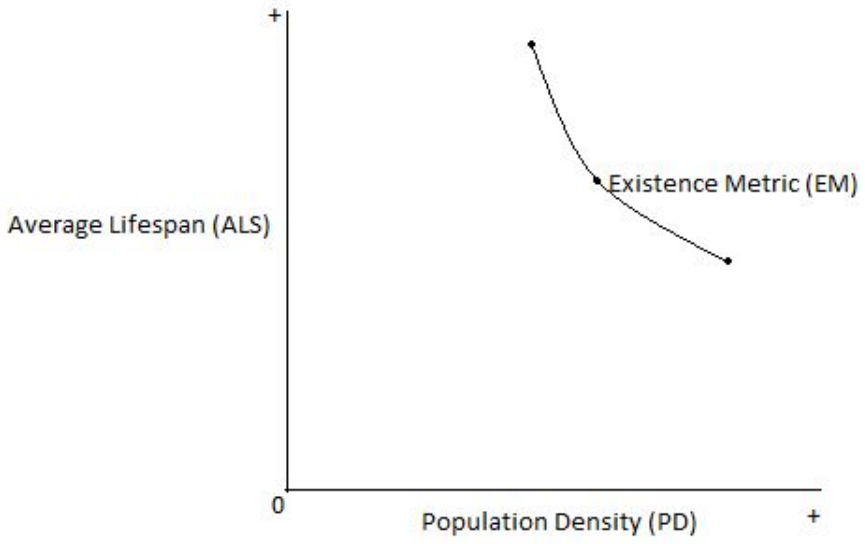
Thus, we find that the proportion of the two measures is not fixed. Yet, both seem scientifically appropriate for measuring the amount of productive action of a society. Given this fact, we can not reconcile them by assuming that they both increase or decrease in the same proportion. However, we can reconcile them by combining them into one measure, which is defined as their product. Thus, the product of the average individual lifespan and population density of a society is an appropriate measure of the degree to which human existence in the universe is being perpetuated by that society. Thus, this value seems appropriate as a metric for comparing the amount of productive action of societies. This value will henceforth be called the Existence Metric, or EM.

We can easily construct a visual model by which this value is represented as an area in a two-dimensional graph, with the respective axes representing the average lifespan (henceforth referred to as ALS) and the population density (henceforth referred to as PD). The size of the area depends upon the location of the EM point in the graph. The further up and to the right the point is located, the larger the EM value; the more down and to the left, the smaller the EM value.



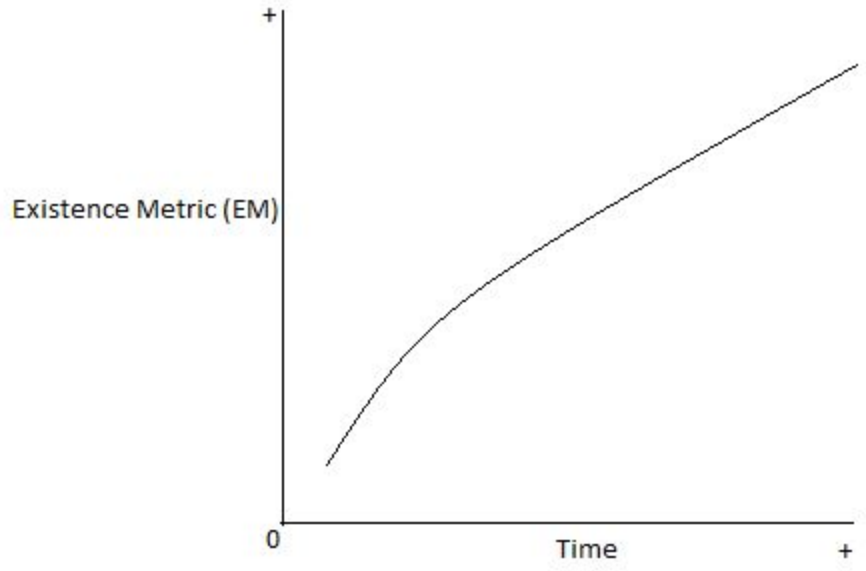
[Figure 1]

It will be noticed that any single value of EM can be attained by an infinite number of different product combinations of ALS and PD. Indeed, each EM value would not correspond to just one single point on the graph, but a line through the graph defined as that line the product of the horizontal and vertical components of which are always one value, or, in other words, a hyperbola. However, we can not assume that all of the infinite number of combinations of the ALS and PD factors (all of the points on such a hyperbola) actually represent potential "options" for a society existing in the real universe. There must be two points of termination on the line which represents a single EM value in the ALS-PD graph. A consideration of the question as to whether a society really could attain a large PD with an ALS value of 1 second should illustrate why this is the case.



[Figure 2]

The growth of the EM of a society over time, an effect to be expected in a society improving the existence of mankind in the universe, can be represented thus:



[Figure 3]

More will be said on this later, in addition to the questions which might arise as a result of these considerations, such as what proportion of the ALS and PD factors is economically "optimal." Before those things are addressed, a few important concepts must be developed.

Productivity

While we have taken a step closer to establishing the metrics necessary to a rational consideration of economic processes and productive action so defined, the following example, perhaps anticipated by some readers, will demonstrate that another crucial metric is missing.

A Paradox in the System

Imagine, again, two landmasses of identical size and environmental conditions- each isolated from the other. Imagine, again, that upon each landmass is placed a group of people and that the physiological characteristics of the individuals in each group are identical. Further, imagine that both groups attain the same ALS and PD value (and thus the same EM value). Despite the fact that the two societies would be the same in all of these respects, one very important difference pertaining to economic analysis could still be present.

Imagine that in one society, the total amount of what the inhabitants considered to be "work" was greater than that of the other. For example, total man-hours worked in one society could be

less than the other. That is, both societies would have the same ALS, PD and EM value, yet, one society could sustain that value with less total man-hours per interval of time. Thus, in accordance with the definitions with which we set out at the beginning to supply the basis for rational considerations of economic processes so defined, we seem to have reached a paradox, or irony, namely: that one society could facilitate the perpetuation of the existence of the human species to the same degree as another society, as measured by the EM value, by performing *less productive action*.

This fact does not impel us to abandon the definitions with which we initiated the investigation. But it does compel us to abandon the idea that the EM can provide the basis for measuring the "amount" of productive action in a society. In addition, and more importantly, this fact compels us to consider the concept of the *productivity*, or, *power*, of productive action.

The Essential Concept of Productivity/Power

The principle of *productivity*, or *power*, refers to a relationship, namely, a ratio, between two things: 1.)The effect to be brought about, or the thing to be produced; and, 2.) The thing requisite to the effect to be brought about. Thus, if one tree, say A, produces more oxygen for a given amount of absorbed sunlight than another tree, say B, then it could be said that the productivity of tree A was greater than that of tree B in reference to their ability to produce oxygen from sunlight. As another example: If one farmer, A, produced more wheat than another farmer, B, and if both farmers were to expend the same amount of time in the field, then it could be said that farmer A was more productive than farmer B, with respect to producing wheat.

As we have defined productive action as that which causally contributes to the existence of the human species, and, as we have already established how the facilitation of human existence by a society might be measured with the EM, all that is now needed, if we are to establish a measure for the productivity of productive action, is a measure for the amount of productive action which can be put into relation with the EM. Once a measure of action is attained, the productivity of that action can be defined as the ratio of the amount of EM to the measured value of action. Thus, we will examine more closely the concept of action, such that the best measure for productive action might be found and utilized in the comparison of productivity.

Action in General

In order to remove some of the ambiguities pertaining to the term "action", a brief examination is here made.

As discussed earlier, all human action can be divided into two categories: productive, and non-productive. In addition to this division, all human action can be divided into two other categories: willful and non-willful. Willful action refers to all those activities which are initiated and sustained by the will of the individual. Such activities include various forms of bodily action, such as walking, talking and so on. It also includes mental operations such as intentional reasoning. Non-willful action refers to those activities which are not sustained by the will of the individual. Such activities include sleeping, sitting, digesting food, or certain mental activities

such as perception. Some activities can be performed on either a willful or a non-willful basis, such as breathing, blinking, or other bodily functions.

Obviously, this division of human actions does not necessarily correspond to the distinctions of human action made by our definition of productive action. For, there may be willful activities which are either productive, or nonproductive, and there may be non-willful activities which are either productive or nonproductive. For example, what effect on human existence, as measured by the EM, would be registered by an elimination of the non-willful action of sleeping in a society? Obviously, sleeping can be a very productive action!

The Measure of Action in General

Finding a measure for action in general involves a problem similar to that which we confronted in the attempt to find a measure for the degree to which a society is facilitating the existence of the human species, namely, that there are two seemingly appropriate measures.

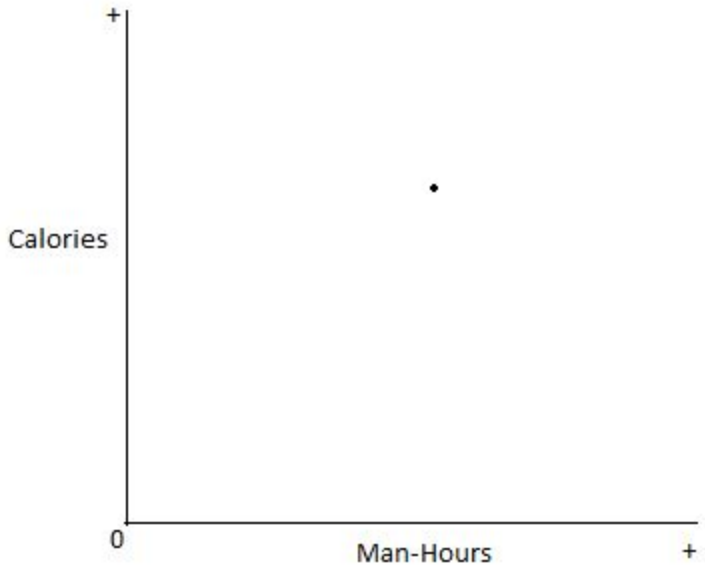
All human action requires energy for its performance. Thus, the action of an individual or group of individuals can be measured by the amount of calories expended in their physiological functions as a result of the performance of that action. But, it could also be said that all human action requires time for its performance, and, thus, the action of an individual or group of individuals can be measured by the amount of time expended as a result of the performance of that action.

Take the following example which illustrates the problem, while also reorienting our attention to the question of productivity: Imagine that two equal size groups of identical people are each given an identical set of materials to build a house. Imagine that after the same amount of time, both groups complete the construction of the house. It might be said, if we were measuring productivity with time, (as in man-hours for example), that the amounts of total action of both groups to achieve the same effect were equal, and, thus, the productivity of the two groups was equal in this respect. But, if we were to find out that, despite the equal time taken to accomplish the task, one group, say A, exerted much greater effort and expended many more calories during the time interval than the other group, say B. Given this, we would hesitate to say that the productivity of group A and B were equal- we would conclude that the productivity of group A was less than that of B given that the members of A had to "work harder" and expend more calories than those of B.

Similarly, if we imagine that group A and B expended the same amount of calories in the construction of their respective houses, but that group A required a longer amount of time to complete the task, we would conclude that the productivity of group A was less than that of B.

The two measures of action, calories, and man-hours, can be reconciled by taking their product. This product will give a value which is appropriate to act as the measure of action: calorie-man-hours (hereafter referred to as CMH). As with the EM, CMH can be visually

represented as a one-dimensional magnitude changing with respect to another variable, like time, or, as a two-dimensional area in a graph whose axes are calories and man-hours respectively.[2]



[Figure 4]

The Productivity, or Power, of Productive Action

Now that we have established a measure for human action in general, we have a measure for that category of human action which we have defined as productive: CMH. Further, because we have established a measure for the degree to which a society is facilitating the existence of the human species, EM, we can now define the measure of the productivity, or power, of a society's productive action: EM/CMH.

Before proceeding, a loose end must be tied up: Earlier, we identified how it is that productive action, as we defined it, could be classified as either willful or non-willful. Because the only action which we have willful control over is willful action, the only measure of productivity which can be said to be a result of our willful actions is that which relies on the measure our willful action. Further, the only action which we are capable of directly changing is willful action, and so, the only way in which the productivity of productive action can be willfully changed is by changing willful action. Thus, the only productivity relationship which is of relevance to us is the ratio of EM to the total amount of *willful* productive action as measured in CMH. I will, hereafter, abbreviate "willful-calorie-man-hours" as WCMH. Thus, the measure of

[2] Incidentally, the unit measuring "action" in physics is also energy-time, or energy seconds, which is the same measure used for human action in this report.

the productivity of *willful* productive action of a society, (which is the only measure of productivity which is relevant to us, or anyone), is the following: EM/WCMH. I will refer to this ratio as P, for productivity, or power:

$$P = EM/WCMH$$

Thus, if two separate societies were to have identical ratios of EM/WCMH, we would conclude that the productivities of those societies were equal. But, if we were to find that two separate societies had unequal productivity values, we would be obliged to investigate the causes for such a discrepancy, and this is precisely what we shall do in the next chapter.

Potential Productivity

Before proceeding to the next chapter, Something which will shortly prove to be of great importance must be identified.

Any given society will have an average lifespan and a population density. These values are measurable (indirectly), and their product defines the EM of the society. In turn, the EM, when put into proportion with the WCMH required to sustain that EM, defines the P value of any given society. But, in addition to having an actual average lifespan and an actual population density, it is clear that any given society will have various *potential* average lifespans, including a maximum one, and various *potential* population densities, including a maximum one. Thus, in addition to having an actual EM, and corresponding P value, a society will have various *potential* EM values (and a maximum one), and corresponding *potential* P values (including a maximum one). We shall hereafter refer to the maximum potential population density as PPD, maximum potential average lifespan as PALS, the maximum potential existence-metric as PEM and maximum potential productivity as PP.

Obviously, the actual is constrained and fundamentally determined by the potential. Thus, the EM is constrained by the PEM, while P is constrained by PP.

III. The Determinants of Productivity

Because the P of a society is fundamentally determined by the PP, we will first examine what determines the PP of a society before we identify what determines the P of a society. Only after identifying the causal factors determining the PP of a society can the identification of the causal factors determining the P of a society be made. This chapter will focus on only PP. The identification of the factors which determine P requires additional considerations to be taken up after this chapter.

The Two Factors which Determine PP

There are two factors which determine the potential productivity of the productive action, PP, of a society: 1.) The conditions and potentialities inhering in the environment accessible to that

society; and 2.) The *array of discoveries*, attained by the society, pertaining to the conditions and potentialities inhering in the environment accessible to that society. This array of discoveries is sometimes called "knowledge."

First Factor: Environmental Conditions

The first identified factor which determines PP is readily understood, and, therefore, will be only briefly exemplified.

Two farmers, with the same skills and sets of tools, performing the same amount of work, as measured in CMH, on equal sized pieces of land to produce the same crop, might be found to produce unequal amounts of crop. What could account for this discrepancy? The mystery would immediately be solved if we were to find out that one farmer was working in a desert, while the other was working on a prairie.

By this analogy can we understand the way in which environmental conditions would play a key role in determining the PP of a given society. Two societies of equal knowledge and with access to identical tools might have different PP values due to differences in environmental conditions.

Second Factor: The Array of Discoveries

Imagine two land masses of identical size and environmental conditions. Two groups of people, the physiological profiles of which are identical, are then each placed on each of these land masses.[3] After a certain amount of time, though performing the same amount of productive action measured in terms of WCMH, one group is found to have achieved a higher EM value than the other. We would then be obliged to conclude that a discrepancy in the power of action existed between the two societies, and that, all other things being equal, this discrepancy must have arisen out of the fact that one society had an array of discoveries, or knowledge, of the universe that the other society did not have. The array of discoveries, or knowledge, assimilated by a society and made to inform the behavior of that society is usually called the scientific and technological "level" of the society.

Potential Relative Productivity, or PRP

Thus the PEM value of a society of a given physiological profile, performing a given amount of work measured in WCMH, on given a landmass of arbitrary size and environmental conditions, would depend solely upon that society's assimilated array of valid scientific and technological

[3] It will be noticed that the physiology of the members of the society must be accounted for. That is, the physiology of the individual members of a society is also a factor in determining PP. Comparing two groups, the physiology of one group of individuals may be such that, even if the quantity of labor, environmental conditions and array of discoveries were the same for both groups, the value of P could still be higher or lower for either. The degree to which this is the case is probably negligible, at least in comparison to the two primary factors identified. It may be argued, however, that the physiology of the individuals in a society actually constitutes a part of the environmental conditions of those individuals. This is a reasonable and a philosophically useful argument.

discoveries. In other words: by fixing the factor of environmental conditions, changes in PP are determined solely by changes in the level of scientific and technological discoveries; by fixing the factor of the level of scientific and technological discoveries, changes in PP are determined solely by changes in the environmental conditions. In order to provide a shorthand way of referring to potential productivity as it is solely determined by the society's array of discoveries, the term *potential relative productivity*, or PRP, will be used. Again, "relative" would simply indicate that the level of potential productivity, PP, is relative to a given set of environmental conditions.

PRP is not to be understood as a specific PP level for a given society under certain environmental conditions, but, rather, as the *capacity* of a society to attain various levels of PP under different environmental conditions. Thus, the PRP can be called the measure the mastery of a society over the world in which it finds itself. Thus, the PRP is a fundamental measure in economics, and it is determined solely by the array of discoveries, or scientific and technological knowledge, attained by society.

Elaborating the EM and PEM

Now that we have established the conceptual basis for the measurement of potential productivity, PP, and defined the term PRP as the capacity of a society to exist which is solely based upon the array of discoveries attained by that society, we will return to elaborate how the EM and PEM are useful as a tools of economic analysis.

The Minimum EM of a Society

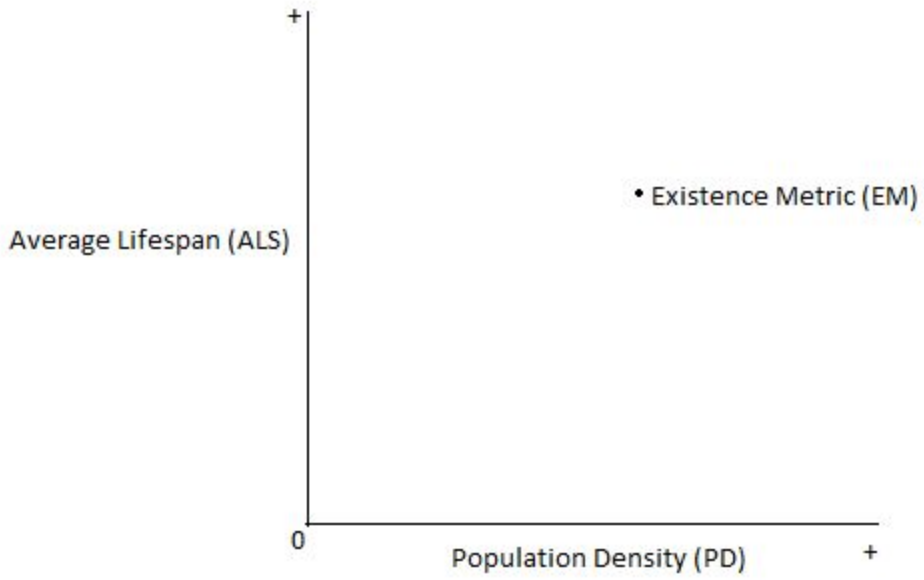
Given the biological constraints of the human physiology, it can be demonstrated that there is a certain minimum EM required for the continued existence of any given society.

We assume a *perfect* environment in which even an unattended newborn baby could survive until the age of 12 or 13. We assume a male and female living in such an environment, and that they engage in sexual reproduction. In such a situation, the father would no longer be necessary after a second impregnation of the mother, and the mother would no longer be necessary after her second birth. Two infants would thus be let to repeat the process about 12 years later. That is, human males are, on average, not capable of impregnating human females until the age of about 13. The average age at which a human female becomes capable of becoming pregnant is, on average, about 11 years. Thus, as illustrated by this hypothetical situation, the ALS of a society *must* be at least about 13 for females (11 years plus 18 months of pregnancy to reproduce 2 humans), and about 14 (13 plus about 9 months to make a second impregnation) for males. Thus, the ALS must be at least about 13.5 years. The minimum average population of a society must be slightly more than 2, but less than 3. This number will be denoted as 2.z. Assuming the land area occupied by these humans to be x kilometers, then the minimum EM value for the human species in this hypothetical situation would be the product of the minimum ALS and minimum PD value, namely, 13.5(2.z)/x years-persons/square kilometers. This is the absolute minimum EM value hypothetically possible for human society.

Obviously, such a situation could never be attained in the real world. Any actual environment will drastically increase the minimum EM value over the one derived above. Nonetheless, the above example is made to show how there must be, given a set of environmental conditions, a minimum EM value under which the existence of a society can be continued.

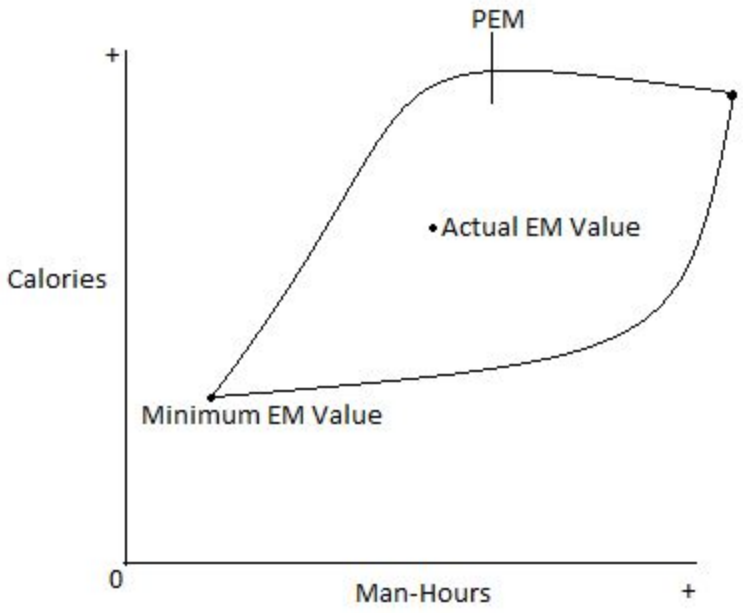
Visualizing the Potential Existence Metric, or PEM

As mentioned above, the actual EM of a society under a given set of environmental conditions and level of scientific and technological progress can be represented as a point in an ALS-PD graph.



[Figure 1]

However, as also mentioned above, a society under a given set of environmental conditions and level of scientific and technological progress will also have various PEM values, each with its respective range of combinations of factors of ALS and PPD. Thus, given a set of environmental conditions, all of the potential values of EM attainable by a society for a certain amount of action with a fixed PRP (scientific and technological level) will be represented on an ALS-PD graph as a bounded area like so:



[Figure 6]

It is not within our abilities to know the precise shape of this figure for a given society. However, the conceptual basis for the shape of the bounded area is not difficult to understand. The ALS and PD of a society will influence and depend upon each other to a certain extent. For a given amount of action, under given environmental conditions at a certain PRP (array of discoveries), the following applies: A certain level of PD will require a minimum level of ALS, and a certain level of ALS will require a certain minimum level of PD. Similarly, a certain level of PD will allow for the attainment of a certain maximum level of ALS, and a certain level of ALS will allow for the attainment of a certain maximum level of PD. The truth of these assertions can be readily apprehended by considering the question: Could any human society attain a PD value of 1000 persons per square kilometer if the ALS of that society were only 1 second?

Two lines are thus formed by marking two points above each point along the horizontal axis which correspond to the minimum and maximum ALS values attainable by the society at each possible value of PD.[4] As we proceed to the left, the two lines converge upon and meet at the minimum EM value of the society under the given environmental conditions and PRP. As we proceed to the right, the two lines meet at some value which represents the highest possible EM value for the society.

[4] (Or, conversely, two points to the right of the vertical axis, corresponding to the maximum and minimum values of PD at each possible value of ALS)

Thus, the PEM of a society is represented. Contained within the PEM of a society is, of course, the actual EM of that society. Considered in conjunction with a given quantity of productive action and set of environmental condition, the PEM is representative of the PRP of a society.

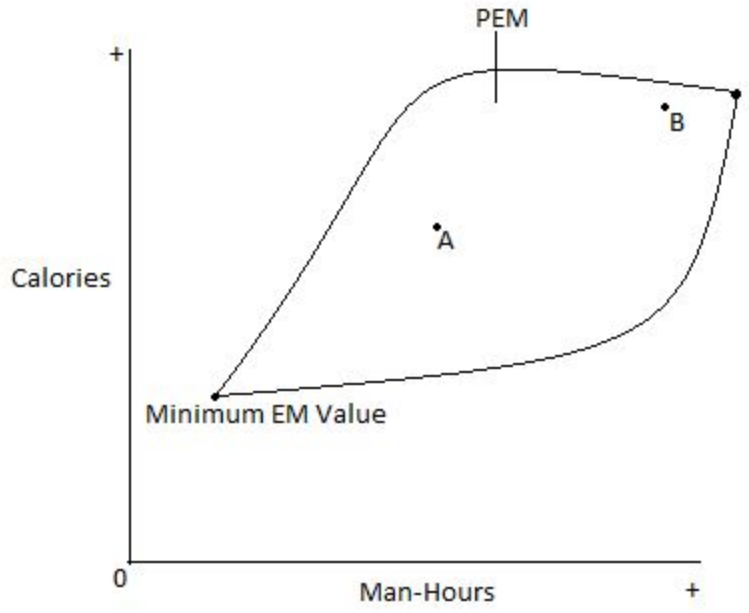
"Optimization"

We now return to the question raised earlier concerning the "optimization" of the proportion between ALS and PD factors of a society's EM. If there are many different options available to the society as to how it can elaborate a given EM value, what is it that determines the balance between the two values which is most conducive to human existence in the universe? The easy answer would be the following: That balance which corresponds to the highest rate of creation and assimilation of new discoveries by society. Such a question is of a cultural nature, and it serves to prove that the metrics of ALS and PD are subordinate to the cultural objectives of society. That is, the best balance of ALS and PD for a given EM is that which is established as a byproduct of the creation of the optimal cultural conditions for the generation and assimilation of new discoveries by the society. After all, that is the only way in which productivity can be increased. What those conditions might be is an important, extensive, and situation specific question which this report will not take up.

As can be seen from the diagram, each level of EM is represented by a hyperbolic line which exists in the area defining the PEM. This provided us with a basis for answering the question as to why it is more difficult for a society to attain its maximum potential EM value at any moment: the options available to that society respecting the possible combinations of ALS and PD become smaller as the maximum potential EM value is approached. The maximum EM value, as can be seen, corresponds to only one single proportion between ALS and PD. Such perfect balances are impossible to attain in reality. Thus, a society never quite achieves its full potential under a given array of discoveries.

The Motion of a Society Through the PEM

The motion of a society through the PEM is very likely not completely free in all directions. Sometimes, the society might have to hit a "roadblock" and go backwards in order to then get ahead a little bit. It seems that this kind of thing would be more common the closer a society gets to the boundary line of their potential, the pathways towards improvement -towards the maximum- become less and less numerous, the society's grip on the standard is more tenuous, and the level of EM which the society has attained becomes less stable.



[Figure 7]

By the diagram, we can conceive of how it is that the stability of the sustenance by a society of the EM at point A would be greater than the stability for the sustenance of an EM at point B- there are more options for variation within the same EM level at A than B.

The Determination of the Actual EM of a Society

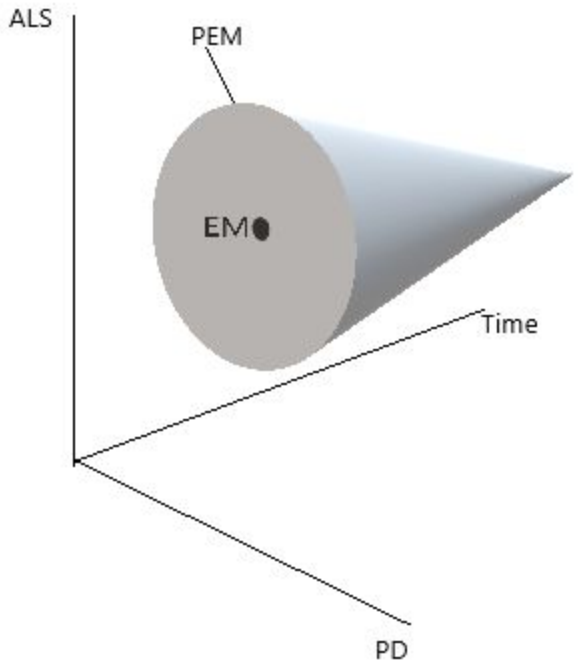
Now that we have identified what are the causal factors which determine the PEM of a society, it would seem that we are in a position to specifically identify those factors which are of greatest influence in determining what actual EM value a society will attain within the PEM of that society.

The basic answer is that the actual position which a society attains in the PEM will be determined by the specific behaviors which that society chooses to adopt. This is, in turn, determined by cultural factors, which will be discussed more later.

Environmental Depletion Over Time

By adding a third dimension of time to the graph, we can construct a volume which represents the PEM of a society over time. If we assume that the environment in which the society exists does not change over time, then the volume has the same cross-sectional characteristic at any point in time which we chose to examine. Thus, assuming that there is no change in the environmental conditions of the society being represented, this three-dimensional model reduces

to the two-dimensional model we have just developed above. If, however, we assume that the environment does change over time in accordance with the normal process of "depletion", the cross-section of the volume, which is the PEM, will tend to shrink over time, perhaps sometimes in rapid "jumps" at certain points corresponding to economic collapses, and, perhaps, eventually collapsing to nothing, corresponding to the extinction of the society.



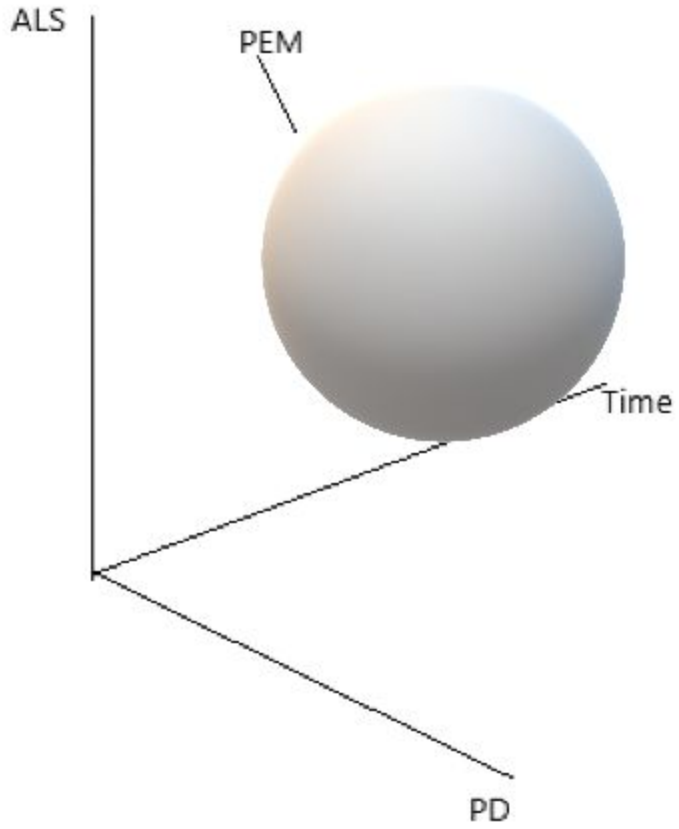
[Figure 8]

What is implied by such a demonstration is the fact that without an increase in the powers of productive labor, no actual society could maintain even their current level of EM indefinitely. Any society which refused to increase the power of productive labor would be doomed to eventually collapse into extinction. This, of course, necessarily implies that without a continued assimilation of scientific discoveries by a society, no maintenance of ALS or PD, at any level, could continue indefinitely, and that society would eventually collapse.[5] Thus, once again, we see how it is that the most important question in economic science is how the most people in a society might be enabled to make the most (valid) discoveries possible for them to make.

Fixing Action

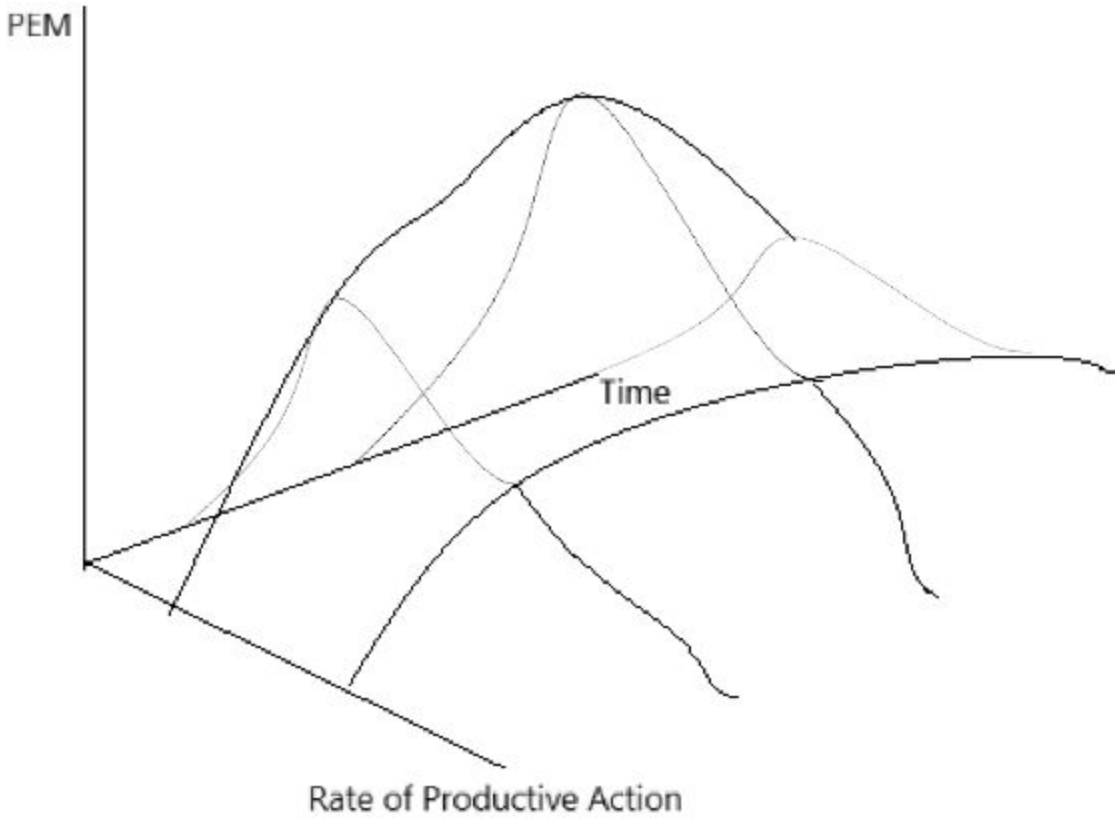
[5] Excepting, of course, the hypothetical (and probably completely impossible) case in which a small group of people find an ecological niche in which the sustenance of their existence impacts the environment around them to such a small degree that the natural reestablishment of environmental conditions results in in no net depletion over time- the romantic "balance" and "harmony" with mother nature which is only plausibly attainable if humans were to choose to live in a state more wretched than that of the baboons- and, actually, not even plausibly attainable then, considering the evidence demonstrating the fact that the biosphere is constantly evolving and that there is no permanent eco-system.

All of these graphs assume, of course, a fixed rate of productive action. We may, indeed, construct a three-dimensional model in which the ALS-PD graph is placed in relation to a third dimension representing the rate of action, as opposed to time. This would, of course, oblige us to assume a fixed set of environmental conditions. Under such a construction, various aspects of the economic process could be represented. For example, the amount of action which maximizes productivity would be that amount which, when compared to the cross-section of the volume (which would be the PEM) resulted in the greatest ratio of cross-sectional area to the magnitude of productive action.



[Figure 9]

As our capabilities of visual imagination *per se*, are limited to three dimensions, we are not able to construct, in the normal sense, a visual model which captures all the relations of time, productive action, ALS, and PD at once. We might, however, collapse the PEM into a single point, corresponding to the total area which the PEM occupies in the ALS-PD graph, and construct a model constrained in three dimensions, like so:



[Figure 10]

For, clarification, it should be pointed out that the time dimension in these representations corresponds to a different state of environmental conditions at the points in time along that dimension. The other dimensions, representing the PEM, and the rate of productive action, are related to the time dimension as they relate to the specific environmental condition at the point along the time magnitude, and that as if that environmental condition were unchanging.

IV. More Rudimentary Considerations of the Human Condition Pertinent to Economics

A Clarification

Since all phenomena are experienced within the mind of the individual, all phenomena, strictly speaking, are *subjective*. However, the terms “objective phenomena” and “subjective phenomena", while seemingly oxymoronic and redundant respectively, can be appropriately employed so long as they bear appropriate connotations. The term “objective phenomena” appropriately denotes those (experienced) phenomena which are thought of as capable of being experienced, in a more or less identical way, by other individuals, in the fashion generally indicated by the term “sense-perception." The term “subjective phenomena” appropriately

denotes those phenomena which are not regarded as capable of being experienced by other individuals in the fashion generally indicated by the term “sense-perception." Thus, a visual object, an odor in a room and an audible sound are all considered to be objective phenomena, while things like emotions, contemplations, and daydreams are all considered to be subjective phenomena. The use of these terms in this report will correspond to these meanings.

Rudimentary Considerations of the Human Condition

It so happens to be an aspect of the nature of the human condition in the universe, that the will of an individual person is capable of directly effecting immediate change in only one part of the world of objective phenomena, namely: the body of that individual person. Any change which the individual wishes to effect in any part of the world of objective phenomena, other than the bodily functions over which that individual has been granted direct control, can only be accomplished indirectly, namely, by the individual commanding those functions of the body under that individual’s will in such a way that their bodily action brings about their desired effect. That is, anything the individual wishes to do in the world of objective phenomena other than move their body can only be accomplished by moving their body as an intermediary step towards accomplishing what is wished to be done.

Obviously, the ways in which the body can be changed directly by the individual human will are quite limited; there are many different functions in the body which are not under the direct control of the individual will. Thus, it should be pointed out that the fact just identified (that the individual can only change parts of the world not under direct willful control by using their direct bodily control to alter those things indirectly) also applies to the other parts of the body which the individual does not directly control. Further, subjective phenomena which are also not under the direct control of the individual will, are subject to alteration in the same fashion: the individual can use their will to alter their body in order to indirectly alter certain subjective phenomena which they are not able to willfully alter directly- as when we move our body when we desire to alter the subjective phenomena of discomfort to that of comfort.[6]

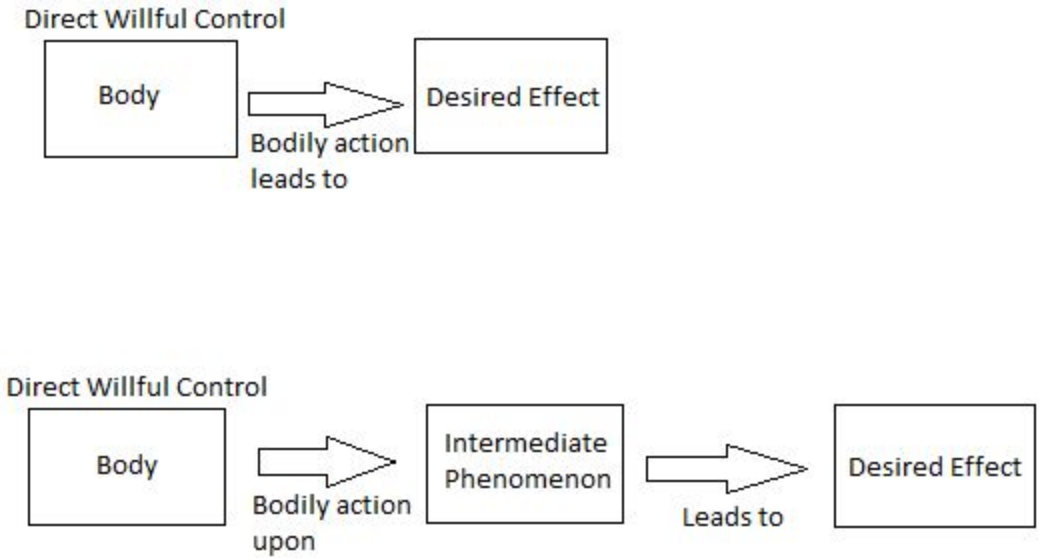
Miraculous and beautiful as the human body is, the frailties, weaknesses, and incapacities of it are quickly appreciated as we try to use it to effect any significant changes in the wider world of phenomena. Impelled by this reality, human beings discovered that certain changes, incapable of being brought about by means of bodily action alone, could be brought about by using the body to bring about some intermediate change which, then, effected the final change desired.[7] By

[6] Obviously, there are certain subjective phenomena which can be indirectly changed by the individual by the individual's use of their ability to willfully change certain subjective phenomena directly to the effect of altering those subjective phenomena which are not under their direct control. This process, of course, might, if one desired, be interpreted as a special case of the individual manipulating their body to affect such changes in phenomena, the only difference being that the individual cannot perceive the minute parts of their body in the brain which are also under their direct control.

[7] If an individual wishes to effect some change, but finds that they are unable to do so by means of bodily action, they may be temporarily at a loss. However, the individual might discover that by using bodily action to affect some other change, the originally desired change is brought about, (or is made capable of being brought about by bodily action).

making such discoveries, man is enabled to effect changes in the world of objective and subjective phenomena which would otherwise be extremely difficult or impossible to be brought about by means of bodily action alone.[8]

The usefulness of this process of discovery to mankind is dependent upon a few things. Firstly, the intermediate phenomenon which the individual changes (in order for the final, otherwise unattainable, desired change in phenomena to be brought about) must be recognizable. That is, the intermediate phenomenon must be distinct from other phenomena. Secondly, the bodily action which is associated with the change in the intermediate phenomenon must also be distinct and recognizable. Thirdly, the change in the intermediate phenomena (what we might call the "intermediate change") and the conditions associated with the intermediate change (other than the bodily action already mentioned) must be distinct and recognizable. Fourthly, the intermediate change and the relevant effect correlated with it must consistently manifest, with at least some reliability, under similar recognizable conditions. Without the fulfillment of these four conditions, the individual would not have the ability to reproduce the final desired effect consistently, and, thus, would derive no lasting benefit from the recognition of the correlation. This, of course, applies to the use of the body to change both objective and subjective phenomena.



[Figure 11]

There are two general ways in which such intermediate phenomena are used: Firstly, and, generally, on a more primitive level, they are used to concentrate and direct, in various ways, the "force" which the individual is capable of exerting with their body. Secondly, and generally on a more advanced level, they are used to concentrate and direct, in various ways, the potentialities of nature.

[8] I will not use the word "tool" here since that word has constraining connotations which would exclude certain things which are used by man in accordance with the principle I am here identifying.

The Definition of "*Goods*", *or, "Resources"*

Thus, any objective phenomenon which is capable of playing the role of "intermediate phenomenon" in this way might be called a "technology", or, a material "good" or "resource."

"Natural Resources"

It should be pointed out that certain things are present in the "natural" world of objective phenomena which, at any given stage of the development of an individual's knowledge of the potentialities of the universe, constitute "goods" of the type just described and defined. These goods are commonly known as "raw materials" or "natural resources."

To re-emphasize a point just made, the only thing that constitutes a naturally occurring objective phenomenon a "good", or a "natural resource", is the state of the individual's (or society's) knowledge fulfilling the four requirements described above, in addition to the (far more significant) scientific hypotheses held by an individual or society, which subsume, and often preclude, such discoveries of the correlation of phenomena. That is, certain hypotheses enable man to predict the occurrence of such regularities of correlation of phenomena even without ever having had experienced, or observed, those regularities of phenomena before. Such predictability is often appropriately regarded as a test of the validity of a scientific hypothesis.

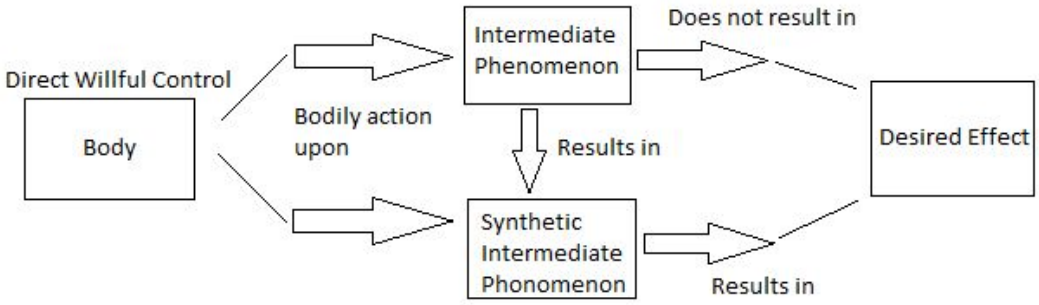
"Synthetic Goods"

On the most basic level, as we have discussed above, certain phenomenal changes can be effected by means of bodily action alone. On the next level, bodily action can be applied to distinct intermediate phenomena which are found in the world of natural phenomena such that a desired change, otherwise impossible to achieve through bodily action, can be effected. On the next level, bodily action can be applied to a distinct intermediate phenomenon found in the natural world which results in the creation of a new phenomenon, which, in turn, is subjected to bodily action to the effect of bringing about a desired change in phenomena otherwise impossible to bring about by means conforming to the two previously described levels. Obviously, from this point, the indicated ordering can be carried out indefinitely[9]

From this ordering, we find that there are two kinds of "goods." 1.) The above mentioned "Natural Goods" which are present in the environment irrespective of human action, and 2.) Synthetic Goods, which are created by man. Synthetic goods are intermediate phenomena which are distinguished on a *functional* basis thus: Those phenomena which are modified by the

[9] The effect produced by the use of a single good of such a kind is not always the final effect one wishes to accomplish. Sometimes, multiple intermediate changes must be effected before the final desired effect is attained, and, thus, sometimes, multiple goods must be used at different stages of the process in which the individual exerts their efforts to bring about a specific desired change.

individual so as to be made efficient, by their use, to the elicitation of changes in phenomena which were otherwise impossible to effect by means of bodily action alone.[10]



[Figure 12]

The Transitory Nature of Goods

As there is no phenomenon known to man which does not change, and, as goods have been identified as a certain special category of phenomena, it follows that there is no good that does not change; there is no good that is permanent. Thus, all goods will eventually lose the functionality which distinguishes them as a specific good. Further, the *use* of goods, as all empirical evidence shows, tends to augment the rate at which the specific functionality of a good is lost. Indeed, some goods lose their functionality, and thus existence as a good per se, upon their first use.

This basic consideration of the nature of goods will prove to be of great importance to the development which follows.

The "Value" of Goods.

Goods and Productive Action- "Valuable Goods"

Now that we have established a clear conception of the nature of goods, we can define those goods which are to be considered as "valuable." As with the effort to establish a concept of value for the action of the individual in society, we can inform our efforts to establish a clear meaning of the concept of value for the goods which are used by a society, based on considerations of what causal contribution to the existence of the human species in the universe which the use of a good might make.

As we have discussed, the use of goods can enable the individual to elicit changes in the world of phenomena which were otherwise impossible to effect. Some such changes in phenomena, which

[10] This point is serves as a response to objections from readers who would take issue with categorizing synthetic goods, which must be nothing but alterations of natural phenomena, as distinct from natural goods.

are elicited on the basis of the use of goods, functionally contribute to the sustenance of the life of the individual as well as the EM of a society. Thus, the use of goods is *necessary* to the performance of certain productive actions.

We can define "valuable goods" as follows: Those goods which prove to have been necessary to the performance of certain productive actions.

This perhaps seemingly peculiar definition will be clarified by a few more considerations.

The Nature of Value

Before we can discuss the value of goods, we must first establish a clear notion of value. Near the beginning of the report, we defined productive activity as that which causally contributes to the existence of the human species in the universe. Thus, we might define "valuable" activity as that activity which is productive. The term value is thus generally defined and applicable to other things besides activity. Asking the question: What kind of *goods* are valuable? We could say that those goods which, by their use, causally contributed to the existence of the human species in the universe. This seems like a simple, useful and elegant way to define value. However, this definition implies certain things which demand careful philosophical consideration.

The Value of Goods

Based on the above definition of valuable, we must necessarily admit that no existing good, whether natural or synthetic, is actually valuable until it is put to use in causally contributing to the existence of mankind. Even if a good has immense *potential* value, that good cannot be considered as valuable until it has made a contribution, by its use, to the existence of the human species. Thus, it might be said that we are putting forth a *retroactive* theory of value. Indeed, we are. Some readers might object to this as mere word play: "Why not simply define valuable goods as those goods which have the potential to be utilized in contributing to the existence of the human species?" As far as defining words goes, this would seem acceptable. But, then we would need to consider the following situation: Imagine that a man produces a synthetic good of immense potential value, but that that good is destroyed in some unfortunate accident before it is ever put to any use. Can we really say that he has contributed anything valuable in the production of this good? We would hesitate to say so; that despite that we cannot but appreciate the efforts exerted by him in the production of that good. Can we say that this individual's action in the production of the good was productive? No. For, by our definition, it did not contribute to the existence of the human species in the universe.[11] Therefore, we cannot say that his action was productive, and we cannot say that the good was productive in any use, and, therefore, if our use

[11] A clarification must be made here. The action of the person who produced the potentially valuable good might still be productive, or valuable, even if that value does not derive from the fact that the good was ever used. For, in the production of the good, the person has developed skills which are of potential value. Thus, if he employes those skills in productive action at some later time, he will have rendered valuable the original action of producing the destroyed potentially valuable good.

of the term valuable is to be consistent, we must not allow it to refer to things, whether they be goods or actions, as valuable unless they contributed to the existence of the human species.

So, we distinguish between valuable goods and potentially valuable goods.

Net Value

It might be argued that *anything* can be put to *some* productive use, and that, therefore, anything could be said to be valuable. This seems true on the surface, but, more careful consideration leads us to recognize that, even though anything might be put to some seemingly productive purpose, it could be the case that the *net economic effect* is negative. As indicated above, all actions performed in the universe involve cost; thus, if the cost of bringing something into existence and employing it in the most productive way possible is still greater than the productive return of doing so, then that thing would have no potential claims to value. (Except, perhaps, as an example of what not to do).

The use of something might seem to improve the EM, even if the production of it lowered the EM to a greater degree. A solar panel might produce some electricity even while requiring, in the final analysis, more electricity for its own production and maintenance than it will ever itself produce. A business might make some money even while operating at a net loss. And so on.

Measuring Value

How might we measure the relative value of one good or action relative to others? We have established the metric which "measures" human existence, the EM. We might, therefore, attempt to correlate each good or action with a certain value taken as a portion of this existence metric. For example, we might try to "measure" the value of a good used or action performed by estimating how much of a change in the EM of society would take place as a result of the elimination of that good or action. If the elimination of the good or action resulted in a decrease of the total EM of society, then the good or action could be said to be valuable. If the EM of a society increased as a result of the elimination of the good or action, then the good or action could be said to have been of a negative value.

Continuing in this vein, we might attempt to attribute a definite quantity to the value of the thing under consideration by attributing to the value of that thing the quantity of the change in the EM resulting from the elimination of that thing in a society.

Paradoxes of Measurement

However, if we attempt to measure the value of each good in this way, we will notice something: The value, measured in this way, of each individual good depends upon the array of goods available to the society as a whole.

Say we are examining a society which has attained a sustained EM of value X. If we measure each individual good in the fashion described above, we will find that, after doing so, the total value does not add up to the EM value of X. It falls short. Yet, if we were to measure the value of all of the goods in a society in the fashion described, we would find that the elimination of the entire array of goods available to that society would result in a loss of the total X value of EM of the society. Similarly, if we were to eliminate large groups of individual goods, the effect on the EM of the society would be greater than the sum of all the changes in EM registered upon the elimination of each of those things, one at a time, (not sequentially, but individually). However, if we eliminated the goods sequentially, we would find that the total effect on the EM would be the same as if we eliminated them all at once. Similarly, the measurement of the elimination of certain groups of goods can register effects which are very large, such that the elimination of some of them would seem to add up to a reduction of the EM in an amount greater than the total EM value of the society. For example, if we were to eliminate one automobile from a society, a very slight reduction in the EM of that society might be registered. This effect would be of a similar magnitude for any individual automobile which we chose to eliminate. However, if we were to eliminate all of the automobiles from a society, the total effect on the EM would be far greater than the sum of all of the changes in EM value registered by the elimination of each car individually.

This demonstrates that value is not measurable in the same way as other quantities are measured by virtue of the changes which they elicit in a certain quantitative measurement. Mass, for example, is measured by observing how much the "weight" value registered on a scale will change upon the elimination or introduction of a material body into the collection of objects on the scale. In the case of mass, it does not matter whether all of the individual bodies are added at once, sequentially, or individually with respect to the rest- the value is always the same. For example: We have a collection of rocks. We place these rocks on a mass scale. We then take note of the numerical value which the pointer on the scale moves to from its original 0 position. Say this number value is Y. Each rock in our collection is given a unique label so that they can all be identified. We remove one rock and take note of the change in the numerical value which the pointer of the scale coincides with. We attribute the magnitude of the change to the mass of the rock which we have just removed. Then, we put this rock back on the scale, and find that the total weight of the collection of rocks is once again Y. We then remove a different rock from the scale and measure the mass of it in the same way that we did for the first rock. After doing this, we put this rock back on the scale. After doing this for all of the rocks, we find that the sum of the mass values which we measured for the individual rocks corresponds to the total mass value Y which the entire collection of rocks is found to have when measured all at once. Similarly. No matter what combination of rocks we remove at once, we find that the sum of their total mass is always Y.

But, as said above, this is not true for the goods possessed by a society and the EM value. The change in the EM value registered by the elimination of any good, or group of goods, depends upon the state of the array of goods available to the society as a whole, (in conjunction with the array of discoveries and the conditions of the natural environment within which a society is situated).

"Supply and Demand"

It will be briefly noted here that the "law of supply and demand" is related to what we have just identified. It is demonstrable that the value of a single good is dependent upon the state of the entire synthetic environment. Thus, the value of a single good is dependent, to an extent, on the amount of other goods like it in the synthetic environment. Generally, the less of an amount of a particular kind of valuable good exist in a society, the greater the negative impact upon the EM of the society the elimination of that good will have. Conversely, the greater the amount of a particular kind of valuable good in a society, the less the negative impact upon the EM of the society the elimination of that good will have. Thus, we can derive the notion of "the more are present, the less valuable, and the less are present, the more valuable", which is the basis of the idea of "supply and demand", as a theorem, of sorts, which is implied by, or follows from, a consideration of, the definitions utilized in this report respecting value and the measurement of value by the EM.

Further, the productive effect of a good is altered by the way in which it is combined with the use of other goods. This is, then, another reason that the value of a single good is subject to variation according to the state of the total array of goods in a society.

The value of goods in an economy measured in this way does not necessarily conform to the *monetary price* of those goods. For, as will be discussed later in the section on money, the determination of price in an economy is significantly influenced by two factors, namely, the willingness to pay, and the willingness to sell. Only to the extent that these factors correspond to the actual value relations of goods, as we have defined value relations, can we say that the value relations of goods correspond to their price. Otherwise, the determination of price is, for the most part, irrational.

Action

It should be noted that all that has been said above respecting the value of goods, also applies to considerations respecting the value of actions.

The Concept of "Synergy" in Economics

The foregoing discussion respecting the peculiar features of measuring the value of goods and actions brings our attention to the concept of *synergy*. Despite that the term "synergy" has a sort of mystical connotation in popular culture today, the principle is readily comprehensible, and has been understood, to one degree or another, as far back as human beings made the first willful choice amongst multiple people to cooperate in order to accomplish something.

The actions of human beings can be coordinated with each other in such a way that the total effect of the actions involved is greater, that is, more productive, than the sum of all the same actions performed in isolation from each other. Thus, the action of the individual becomes more productive if it is performed in productively synergistic coordination with other actions. Similarly, the action of an individual becomes more productive, or harmful, to society, if it is

performed in synergistic coordination with other actions in bringing about a nonproductive effect.

There is nothing surprising in what has been noticed here about synergy. However, we are confronted by one peculiar irony respecting the claim of an individual to the responsibility for the effect which they causally contributed to bringing about. That is, the synergistic coordination of actions by individuals demonstrably increases the total effect of the labor of the individual; yet, the ability of each individual to claim responsibility for the total synergistic effect is reduced, since multiple other individuals also made contributions to bringing it about. Thus, through synergistic action, the individual can lay greater claims to altering the state of the universe (for better or worse), yet, at the same time, the ability of the individual to claim responsibility for bringing about that effect is lessened.

The Concept of "Grace" in Economics.

The subject of "grace" is usually relegated to theological discussion. A religious example of the concept of grace would be the Christian notion that, by the grace of Jesus Christ, those who were undeserving, or unworthy, were saved. That is, saved from a life of sin, or other unpleasant things. Another religious example would be the idea that one was "saved by the grace of God"; that is, saved from something unpleasant even though one did not do anything to deserve to be so saved. A non-religious example of grace can be heard in the phrase "Can you grace us with your presence?." That is, we are unworthy of your presence, but we request that you will grace us by being present with us anyway.[12]

This concept applies in economics in the following way. Because the determination of the value of any good or action is made only by the effect which that good or action causally contributes to bringing about, we have the following: An action may be performed which is carried out by a person with no good intention whatsoever and which brings about a certain effect. If the effect is something which is of no apparent value, then it would seem, at first, that the action of the individual, and the effect itself, are both non valuable. However, another person may come along and find some productive use which that effect could allow them to perform. If this person chose to perform such a valuable action on the basis of the otherwise non-productive effect, that person makes that effect valuable, and, by consequence, the action of the person who produced that effect, even though they had no intention of contributing anything useful to humanity by doing it. Thus, by the grace of the person who came after, the actions of the former person were made valuable. For example, a Wall-Street banker makes money by laundering drug money, but, then, finding his way of life to be intolerably immoral, decides to donate his ill-gotten gains to a charity which uses the donated resources to perform valuable actions. By the grace of the charity workers, the drug-money launderer might be saved from leaving nothing but a mark of shameful

[12] (This can, of course, have different meanings- one being sarcastic, in which the vanity of the person being asked the question is indirectly addressed; another other being sycophantic, in which the questioner actually believes the person questioned is their superior to such an extent that they are unworthy to be in their presence; another being facetious, in which the questioner basically says "wouldn't it be funny if I were actually asking this with utmost seriousness?")

waste and non-productive action on the face of history, saved from the hell of being known, eternally, to the universe, as one who inhibited the development of mankind.

Of course, it is not correct to claim that an action which seems totally undeserving of being considered valuable is the only kind of action whose value is determined by the actions of those who come after. As mentioned above, even actions which produce things of great potential value must be made valuable by those who come after. But, what about those actions which contribute to the EM of a society directly? A doctor, for example, will make the actions of the medicine-makers valuable by using those medicines to save the life of someone who would have otherwise died. But, if that person then uses their life to harm society, it seems that we must conclude that even the work of the doctor was made not-valuable. Were Hitler's personal physicians valuable? The point being made is not that medical care should not be given to everyone who needs it, the point is that the value of anything, even something as beneficent as medical care, is determined by those who make use of the effects of that action. Will they contribute to mankind or not. There might be said to be such a thing as "Anti-Grace." We simply apply the concept of grace in the negative. A person might produce a good of great potential value to humanity, but, that good is used by someone else to carry out an action which is harmful to humanity- that is, negatively valuable. An example of this would be the scientists who created the capability to unleash chain reaction atomic fission in the form of the atomic bomb and other things. The atomic bomb and other things powered by chain reaction atomic fission are of great potential value for mankind. However, as we all know, the atomic bomb has also been used to unnecessarily kill a large number of people. Thus, the great achievement of those scientists was made anti-valuable to mankind by Harry S. Truman. However, the work of those scientists has been elevated to the realm of value once again by the implementation of chain reaction atomic fission in the form of nuclear power plants and other things such as (hopefully in the future) fission rockets. Even atomic bombs are of great potential value, as illustrated by their immense excavation potential.

Grace from the Past

We will notice, however, that much of the grace bestowed upon society comes from those who existed in the past. Indeed, we are all born with things bestowed upon us. But it cannot be said that we did anything before our birth which made us *deserve* those things in the normal sense. Thus, by the grace of those around us, we are provided for as children; and by the grace of those who came before us and are now dead, we reap the benefits of their labor by the use of the things which they left behind for us, before we did anything to *deserve* them. This has implications respecting the value of our own actions. How could our actions be valuable without the use of those goods provided to us from the past labor of others, either alive or dead? Whoever produced the good which is used in a valuable way by an individual who comes after them is also causally responsible for making valuable the action of the latter individual.

Value, and the Causal Chain of Human Existence

From the foregoing considerations respecting the increase of the value of an individual's action by virtue of synergy, the state of society, and the concept of grace, we might say that the actions

of the individual are made more valuable by the grace of the society. Conversely, only by the grace of the individuals in the society are the actions of all of those in the past who have causally contributed to the creation of the current state of society made valuable, or, perhaps better said, kept valuable. And only by those actions are our actions made valuable. As Lyndon LaRouche remarks in one of his books on economics, “Each and every one of us is, for better or worse, a person of *universal* significance." For, by our actions, all preceding qualifying human action, and all future qualifying human action, is made valuable. We use the word “qualifying” because, obviously, some actions are taken which are negative in their effect on humanity, and are never again made valuable by the grace of anyone. Such actions do not qualify for entry into the array of actions comprising the causal “chain", or, perhaps better said “structure", of the course of human existence in the universe.

Here we encounter a problem which seems to undermine this report’s construction of a theory of economics. That is, if the value of something can only be determined by whether that thing contributed to the perpetuation of the existence of the human species, it seems that we are not then able to say, with certainty, the extent to which anything is valuable. For, as we have shown, the relative value of an action or thing is determined by the way in which the result of that action or thing is used. Some actions contribute to the existence of the human species over some interval of time irrespective of other actions taken after them. But, the value of an action may increase over time as a result of the continuing valuable actions of others which take place on the basis of that action. A truly valuable action has the ability to become ever more valuable, for it can be identified as a causal contributor to the basis upon which an ever increasing set of valuable actions can take place. How strange this might seem to some readers! An action which proves to be of true value to the human species, only becomes more and more valuable as the human species continues to exist in the universe. As the human species perpetuates itself in the universe, the valuable actions of the past become ever more valuable even while growing in number- quite contrary to the typical supply and demand relations which most are wont to judge as the factors of “value." Value, at least as we have defined it, therefore, might be said to be a sort of transcendental measurement, for it can exist for a given thing even though that thing is passed away; and, as mentioned, the value of any thing can change.

Thus, the *absolute* determination of value can only be made on the basis of the knowledge of all past and present time. Only an omnipotent Being could make such a determination. No human could ever know the absolute measure of the value of anything. But, this is not really a problem. For, this is the very case encountered in all branches of physical science- we cannot know, with absolute precision, the relations of the things which we are investigating, whether those relations be quantitative or other kinds of relations. Nonetheless, science, though based on provisional and approximate judgments about things, has enabled mankind to increase his mastery over the universe which he inhabits, as indicated by the increase of the EM of human societies of the course of time.

The Necessity of Humanity’s Immortality

Given these considerations, we confront another problem. That is, if the value of something can only be determined by whether that thing contributed to the perpetuation of the human species, it

seems that we are not then able to say with certainty that *anything* is valuable. For, the entire human species might go extinct, and, thus, every single action taken by the human species would, in that case, be incapable of being considered valuable in the final analysis.

Thus, we can continue our use of the concept of value, as we have defined value, in our study of economics, if we maintain the assumption that the human species is an immortal species. As should be clear to the reader, this assumption is the one which we must adopt if we are to accept the definition of value adopted in this study, and, if, on the basis of that assumption, the study of the value relations, including the study of the allocation of valuable goods, adhering in an economic process is to be of *any meaning or significance*.

No One Will Be Left Behind

"No One Will Be Left Behind" - Xi Jinping, President of China. Given the above considerations, we can identify the profound truth in the statement quoted from President Xi Jinping of China. As was indicated by the elaboration of the paradoxical results arising from the attempt to measure the value of an individual's action, the value of an individual's action in a society must be considered as valuable only as it is part of a larger array of actions which enabled the production of an effect which could not be attained by the additive actions of otherwise isolated individuals. The actions of the individual in society are thus "diffused", by virtue of what we identified above as "synergy", into the total distinct effect which the actions of the individual participate in bringing about. The total effect, resulting from such a synergistic, "dissolving" combination of individual actions, is the thing to be judged in determining the value of the individual actions involved in bringing it about. Thus, if the total effect of a dissolving combination of synergistic actions is one which is proven valuable, then every action causally involved in producing that effect is valuable, and, being valuable, has a place, forever, in the causal structure of an immortal human species, granted that the valuable effect so rendered touches, to some degree the whole of mankind.

I might be said that the task of the statesman and the economist is to create the synergistic conditions in which every single person can perform valuable actions such that they are secured a place in the community of individuals made immortal by their contributions to the perpetuation of humanity. Some such contributions may be more distinct and critical to the causal chain as a whole; some may be highly diffused along with the actions of many others. But, each and all share a place in that causal chain which we have faith the Creator of this universe intends to be unending.

Goods, and the EM of Society

Two Assumptions

It could be argued, with some degree of plausibility, that the human species *could* exist solely on the basis of the use of natural goods, and that the creation of synthetic goods, of any kind, is not actually necessary for the existence of a society. The relevance of this argument is dependent

upon which of two assumptions is made respecting the actual possibilities which exist for man in this universe.

We pointed out earlier that for any given set of environmental conditions, there is a minimum EM value which must be attained by a society in order for that society to continue to exist. Thus, asserting that a society could exist in a given environment without the use of synthetic goods of any kind, implicitly states that the minimum EM value corresponding to that environment could be attained without the use of synthetic goods.

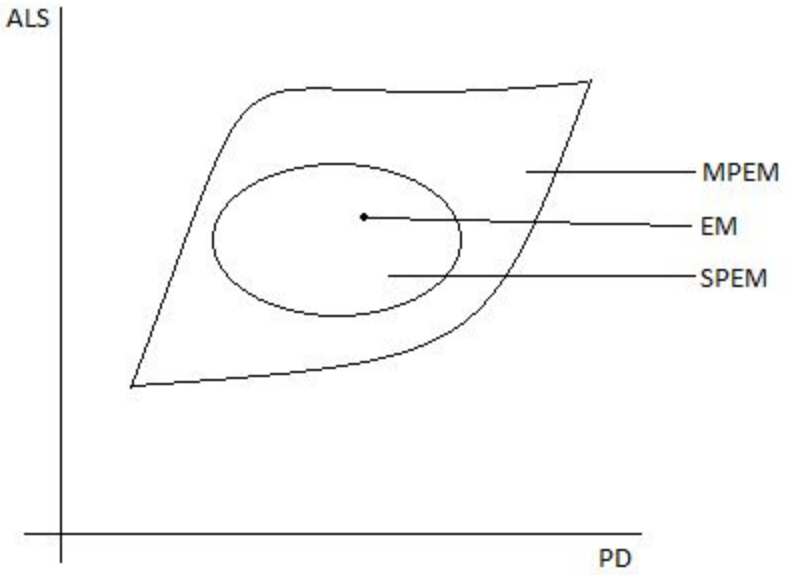
Thus, respecting the *actual* environmental conditions which human beings will confront in their existence, we are confronted with the question: Are there any *actual* environments with given minimum EM values which are attainable by humans existing in them without the use of synthetic goods of any kind? One may assume that there are. But, even for those who would make that assumption, it seems that they would be obliged to admit that such environments are extremely rare, and that, further, no society actually ever operated without the use of synthetic goods anywhere, even in such environments. The other, contrary assumption, is that no such environments actually exist, and that in any environment existing and actually available to occupation by man, the minimum EM value will be such that any society wishing to continue its existence in it must make use of synthetic goods. We will adopt this latter assumption in what follows.

The Synthetic Environment

Now that we have defined and elaborated upon the concept of goods, and the division of goods into the categories of natural and synthetic, we are now in a position to discuss the third primary determinant of the EM value of a society, namely, the *synthetic environment*. The "synthetic environment" is defined as the total aggregate of synthetic goods which are available to a society.

Imagine the following scenario: An advanced society existing in a natural environment of desolate desert conditions which, despite such conditions, is able to sustain very high levels of EM because of the high level of the array of discoveries they have achieved. We could imagine the kind of synthetic environment this society might have: nuclear power plants, water desalination facilities, advanced agricultural methods, an efficient transportation system, and so on. Now, imagine what would happen to the PEM of this society if, suddenly, the entire synthetic environment were to disappear, and all of the inhabitants of the society left naked in the desolate desert where that synthetic environment once was. Despite the great level of scientific knowledge which this society possessed, the PEM of this society would immediately collapse, and mass death would ensue. This illustration ought to be enough to demonstrate that the state of the synthetic environment of a society is another determinant of the PEM of the society. Returning to our ALS-PD graph, we can depict the potential field of PEM resulting from the

state of the synthetic environment of a society as follows:



[Figure 13]

We will refer to the EM potential field determined by the condition of the natural environment in conjunction with the array of discoveries possessed by a society as the maximal PEM, or MPEM. We will refer to the EM potential field determined by the condition of the synthetic environment as SPEM.

As can be seen from the graph, the SPEM is contained within the larger MPEM. The reasons for this are clear: The MPEM represents the maximal potential EM value range available to be attained by a society given a certain level of knowledge and natural environmental conditions. The actualization of that potential depends upon the application of knowledge by the society to the actual behavior of society, including, of course, the production and utilization of synthetic goods which bring to bear the level of scientific discovery attained by the society upon the EM. As discussed, synthetic goods enable man to influence the world of phenomena in ways which were otherwise impossible for him to accomplish; and, some such changes are necessary for the sustenance of the EM of a society.

To briefly illustrate the point: It is well known that, in the decades following WWII, the Soviet Union and the United States had very similar levels of scientific knowledge and natural environmental conditions. Yet, the Soviet system collapsed in 1989, while that of the United States did not. The reason for this cited by economists like Lyndon LaRouche is that the Soviet society did not develop its synthetic environment in the way that its scientific capabilities would have allowed it to do; the scientific capabilities were never actualized in the form of technological dissemination throughout the Soviet economy, or in sufficient infrastructure development. This proffered explanation respecting the collapse of the Soviet economy, as

measured by the collapse of the EM of that economy, is in accordance with what we have put forth here as the third determinant of the PEM, and thus EM, of a society.

An Unchanging Synthetic Environment

Because of the transitory nature of all goods, including synthetic goods, a certain problem arises in conceptualizing how it is that the synthetic environment determines the PEM of a society. This difficulty is overcome by employing the same idealization in a hypothetical economic system as we did in illustrating how it is that the conditions of the natural environment in conjunction with the array of discoveries determine the PEM of a society. It will be recalled that we asked the reader to consider the condition of the natural environment as unchanging, and that this enabled us to show how changes in the array of discoveries would alter the PEM of a society. Similarly, we can imagine that the synthetic environment in which a society exists also does not change. In order to do this, we would need to imagine that all of the synthetic goods of the society were permanent in their functionality. In the case of goods whose very function is to change their functionality, such as explosives, or other chemical substances, we can imagine that the stocks of such goods are magically replenished. (Remember, we are only imagining this hypothetical situation to illustrate a point.) Thus, under a fixed array of discoveries, a fixed natural environment, and a fixed synthetic environment, a potential is established respecting the options of actions available to a society. The specific behavior of the society, under these three constraints, will determine the specific EM value which the society will attain within the SPEM, and the larger MPEM.

A Changing Synthetic Environment

But, of course, the synthetic environment does change; indeed, the synthetic environment of a society will *deteriorate* over time. The effects of this deterioration on the EM of a society are comparable to the effects of the depletion of the natural environment which we discussed earlier. One difference, however, is this: Because the synthetic environment is, at least in extreme majority, only created by man *willfully*, the issue of depletion respecting this environment does not have the same economic implications as the issue of depletion of the natural goods environment does. The PEM of a society can only be sustained at a given level under conditions of natural goods depletion if the array of discoveries of that society is being augmented to the effect of increasing the total productivity of that society. However, assuming an unchanging natural environment, the depletion of the synthetic environment of a society does not imply that that that society must augment its array of discoveries. For, as mentioned above, the synthetic environment is willfully created by society, that is, society operating under a certain array of discoveries. Therefore, the recreation of the aspects of the synthetic environment which have decayed does not require an advance in knowledge, since the society which created them did so with the knowledge that it already has. This is not to say, however, that a society is capable of reproducing the aspects of its synthetic environment which have decayed at any time. For, the production, by the society, of one aspect of the synthetic environment may have been highly dependent on the use of other aspects of the total synthetic environment at that time. Thus, if those parts of the synthetic environment which were used by a society at a former time to produce another part of the synthetic environment have decayed and not themselves been

replaced by the time that other part decays, the society will not have the capability to reproduce that part until the other parts necessary to its production are replaced; at the very least, the society will not be able to reproduce those parts with the same required amount of labor- that will increase. Indeed, we can imagine that the sequential elimination of individual parts of the synthetic environment relied upon by a society for the sustenance of its EM level might cause a gradual contraction of the SPEM, but, also, that, at a certain point in this process of elimination, the SPEM value of the society might contract in a rapid, even quantized, fashion. Such a situation might be appropriately called a "breakdown crisis of the synthetic environment", or, a "physical-economic breakdown crisis."

V. Economic Input/Output

As we indicated earlier, a society which sustains a certain level of EM, under any actual environmental condition, will utilize a certain array of synthetic goods which are necessary to the sustenance of that level of EM. That is, every society will depend upon the use of a certain array of synthetic goods in order to attain any specific level of sustained EM. This array is different for societies which exist under different environmental conditions, and which posses different arrays of discoveries.

Economic Output

We will define "Economic Output" as the total aggregate of synthetic goods produced by a society over a given interval of time.

Economic Input

We will define "Economic Input" as the total aggregate of synthetic goods used by a society over a given interval of time. Because all economic input, by this definition, is synthetic, economic input is nothing but utilized economic output. Thus, input and output can be used with a certain degree of interchangeability.

Relevant Goods, or, *Relevant Economic Input/Output*

The array of synthetic goods the specific synergistic utilization of which results in a net contribution to, or is capable of making a net contribution to, the EM of a society is the array of synthetic goods which is is of interest to us. Therefore, this is the array for which we will proceed to develop a useful representation.

Conceptualizing and Modeling Relevant Economic Input/Output in the Economic Process

A Useful Idealization

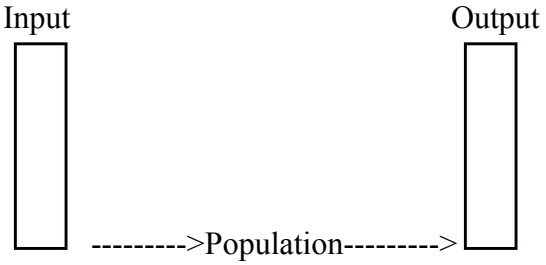
We can say that the economic input of a society over a given interval of time is the amount of output (synthetic goods) consumed over that interval. Because, over an interval of time, some of

the goods produced as output during that interval will be used as input, there will be an overlap in the goods categorized as the economic output and those categorized as economic input over that interval of time. By assuming that all of the goods used as input over a time interval are completely used up in the course of that time interval, and that all of the goods produced as output during that time interval are not used during that time interval, we create a hypothetical situation, an idealization, in which there is no overlap in the goods categorized as economic input and those categorized as economic output of the society. By clearly distinguishing the goods aggregates of economic input and output in this way, we provide ourselves with certain capabilities to better consider the relationships inhering in the economic process- we provide ourselves with a useful heuristic device.[13]

This considered, we will now introduce an idealization which is heuristically useful to the consideration of the input and output relationship of economic processes and more: Imagine that, at a certain point in time, a society, with a fixed PP, has available to it a certain aggregate of synthetic goods. Imagine that this initial aggregate of synthetic goods is capable of sustaining the productive action of the society, at a certain P, over a certain interval of time before this aggregate is completely used up. If, after that interval of time, the society had completed the production of another aggregate of synthetic goods identical to the first, then that society would have provided the basis for a continuation of its existence, at the same level of P, for at least another interval of time identical to the first.

Visually Modeling the Idealization

One way to illustrate the idealized economic process just described is by a "bar diagram":

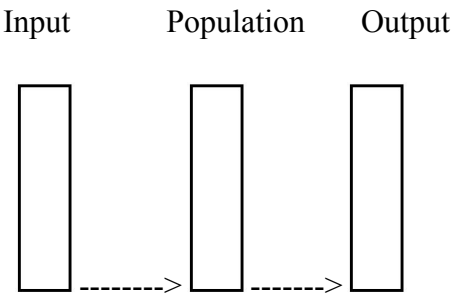


[Figure 14]

[13] I have developed a model of the economic process which does not rely upon this idealization. The alternative model, which I will illustrate in a future report, is a model which represents the process of consumption and production over time *continuously* as opposed to idealized as being quantized over finite intervals of time. However, the quantized model of the process of economic reproduction is sufficient for providing the basis for sound judgments about economic and monetary processes. The model to be utilized in this report, in its essential aspects, is that which has been utilized by Lyndon LaRouche and others to good effect. See chapter four of Lyndon LaRouche's "So, You Wish to Learn all about Economics?"

The input is consumed, or used, by the people living in a society, or population; and the population is, in turn, able to produce an output of another array of goods of identical characteristics.

The population itself can also be represented as a bar like so:



[Figure 15]

The Idealization can also be modeled in the following way.

[Figure 16]

In Figure 16 the horizontal axis represents time. The goods available to a society at T1 is the bar on the left. The existence of the population of the society in time is represented by the motion of a vertical red line to the right. After reaching T2, at which point all of the goods represented by

bar A will have been used up, a batch of identical goods will need to have been produced and made available to the society.

Developing the Diagram

The usefulness of representing the population of a society and the input/output as bars is evident when we consider the necessary stratification of each of these components of the diagram.

Population

A brief discussion of the functional economic stratification of population is required. As people are not mindless machines, but creatures endowed with free will, a precise and rigid classification of an individual in a society. For, a person might perform some sort of clearly distinguishable economic function one day, and, the very next day, perform a function which is of an opposite nature. However, by considering the primary economic function of an individual, categorization, at least for purposes of modeling, becomes more tenable.

We have already discussed the difference between productive action and non-productive action. A person may engage in both over any given interval of time. However, we can take the average of an individual's productive action over a certain interval of time in the following way: If, over a given interval of time, the elimination of the total action performed by an individual would have resulted in an increase or a decrease in the EM of society during or after that interval, then that action would have been productive or nonproductive accordingly as the effect was positive or negative respectively.[14]

Thus, in the model we are using, the population can be classified into two general categories: 1.) those whose total action over the interval in net productive; and, 2.) those whose total action over the interval is net non-productive.

Those persons falling into category 1 can be further stratified into two categories a.) Those persons engaged in the production of valuable synthetic goods (that is, in the production of economic output); and, b.) Those persons engaged in the utilization, or deployment, of those valuable synthetic in such a fashion which causally contributes to the effect of maintaining the EM of a society at a certain level, or increasing it.

Briefly, returning to the problem of categorization mentioned above, specifically, as that problem relates to the categorization of the population on the basis of the categories just enumerated, we can allow for this categorization in our model by classifying the *primary* action of the individual according to these enumerated types.

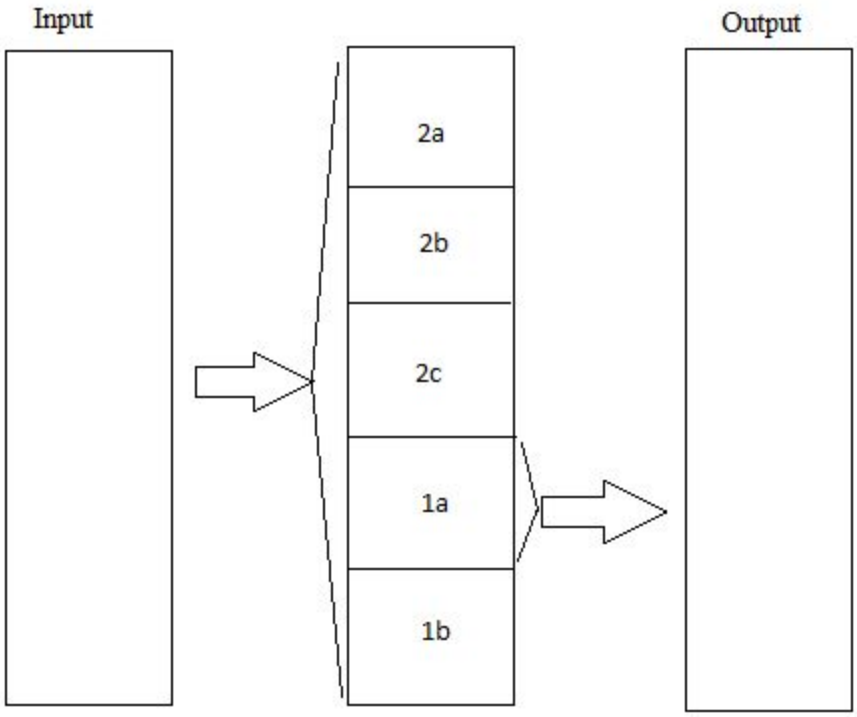
[14] It will be noticed that we are also idealizing the grace period in which the otherwise non productive actions of an individual are rendered productive by a future productive utilization (or grace). We are limiting the grace period to the time interval of consumption of the subsequent cycle of consumption.

Those persons falling into category 2 can be further classified on the basis of the reasons for their lack of positive contribution to society. a.) Because of mental and/or physical incapacity; b.) Because they lack opportunities to engage in productive action. c.) Because they choose to directly engage in significant amounts of what they may either know or do not know to be non-productive action. Obviously, as in the other categorizations, many people in category 2 might partake of each category, but, again, we will proceed with the categorization based upon the primary reason as to the individual's lack of productive action.

Thus, the population bar in our model can be segmented thus:

[Figure 18]

Thus, we have the following visual representation of our idealized model:



[Figure 19]

As can be seen, each population sector is allocated a portion of the input.

Using the Model

With the assistance of this visual model, some of the basic aspects of the economic process can now be elaborated.

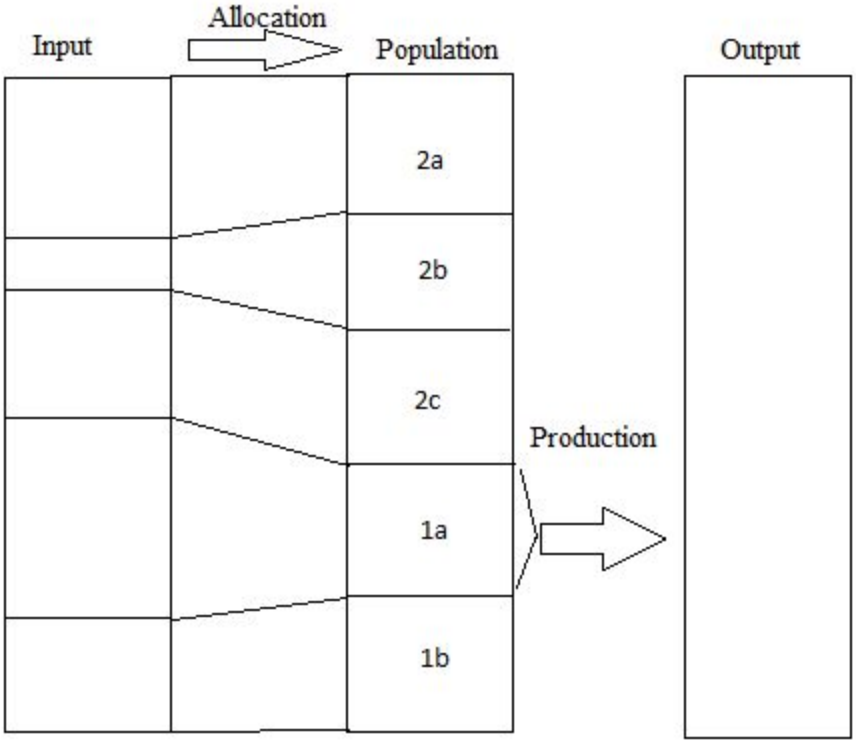
A Basic Theorem of Economic Input/Output

Because the P of a society is determined by its PP and the state of its synthetic environment, (specifically, the above mentioned relevant array of synthetic goods which are part of that environment), the following is true- If, at a given moment in time, a society, operating under a certain fixed PP, has access to a certain array of valuable synthetic goods, then that society will have an immediate P. If, after any arbitrary interval of time, that society has used up a portion of those valuable synthetic goods, and also has not reproduced them in that same interval, the P of that society will decrease after that point in time.

Illustration

We assume a society, existing in an unchanging environmental condition, and with a fixed array of discoveries (a fixed level of scientific and technological progress), or, in other words, a fixed PP. We assume that the society at time T1 has available to it an aggregate of valuable synthetic goods which is utilized as economic input. We assume that the utilization of this economic input over an interval of time allows the society, with a given amount of productive action X, to sustain a certain EM value Y, and, by the end of the time interval, produce an economic output equal to the input. So, a certain portion of the input is allocated to population class 1a which, on the basis of that allocation, was able, with a certain quantity of action, to reproduce an output equal to the input by the end of the time interval. A certain portion of the input was allocated to the population class 1b and, on the basis of that allocation, that sector was able, with a certain quantity of action, to enable the society to attain a certain level of EM over the time interval. The remaining portion of the economic input was divided between population classes 2a, 2b and 2c.

We can represent this distribution of the input amongst the various population sectors as follows:



[Figure 20]

This image provides a useful way of visualizing the alterations in the distribution of the input to the different population sectors of a society.

Examples

We now will examine the effects implied by the alteration of the distribution of the input to the population under various conditions. It is important to note that, in the following examples, no

mention will be made as to *how* or *why* the distribution of input into the various population sectors occurs or is altered. For now, we are only examining the necessarily adducible effects which would result were various alterations of the distribution to be made. Later, we will discuss the *how* and the *why* respecting distribution of economic input/output.

We retain the assumption that the society is operating under fixed environmental conditions, and a fixed array of discoveries, that is, we assume that the society has a fixed PP.

Further, we make the following assumptions:
-The level of input allocated to a is that which is requisite to the production of an output equal to the input with a given amount of action on the part of population sector 1a (in the context of the society as a whole).
-The level of input allocated to 1b is that which is requisite to the attainment by the society of some value of EM with a given amount of action.
-The levels of input allocated to 2a, 2b, and 2c are such that, increases in allocation to these sectors does not produce significant increases in the total EM of society, or, of course, any increase in economic output.[15]

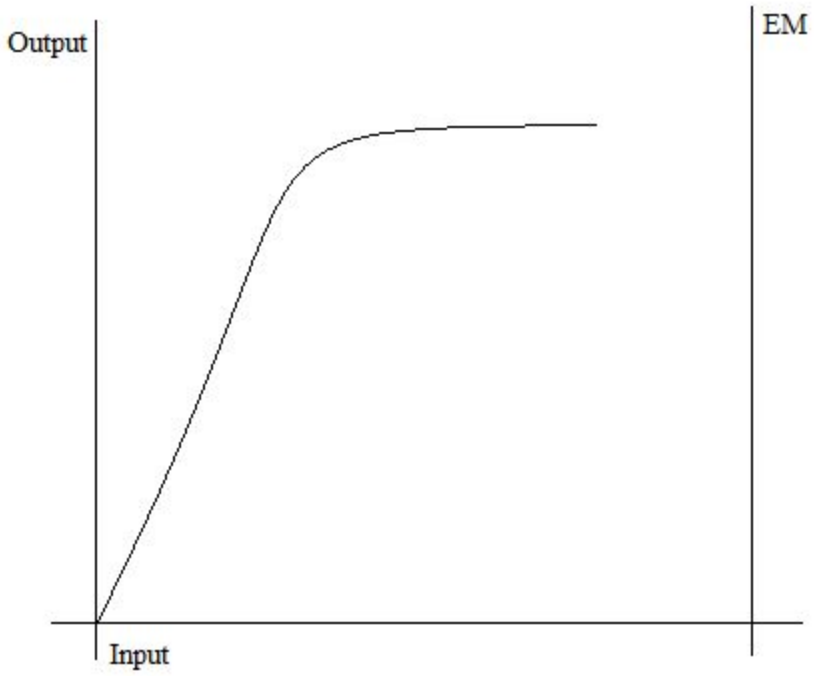
Example 1:
-Change: Increase the input allocated to population sector 2 at the expense of population sector 1a. Result: Because the input originally allocated to sector 1a was that input which was required in order for 1a to produce the total output with a given amount of action, only two possible effects could occur: 1.) The output would be reduced, and, thus, the EM of society, in the following time interval, would be reduced. 2.) The amount of action performed by 1a to produce an output equivalent to the input will be increased. In the latter case, however, could not continue indefinitely, for, if the valuable synthetic goods utilized by 1a for the production of economic output were to continue to dwindle, a point would be reached at which sector 1a would be unable to produce the same economic output no matter how much action they might perform. Additionally, the quantity of action (WCMH) capable of being performed by a group of individuals during an interval of time is biologically limited. Further, as the quantity of action

[15] Because we simply describe the function of the populations as within these categories, there is no need to ask "what if a greater allocation to the persons in category 2 would make them net contributors?" for, in that case, we would not be allocating to persons in category 2 but, rather, increasing the number of persons included in category 1a or b (depending on the primary mode of contribution of the individuals so changed). Allocating more input to persons in category 2 may decrease or increase the net impact of those persons on the EM of the society. Allocating more to persons in category 2 such that they become part of category 1 may also increase or decrease the EM of a society depending upon how it is effected. For example, the increase in the total number of people in a net productive mode of existence could be brought about by reallocating a portion of the input to persons in category 2 at the expense of persons in category 1. In such a case, it could be that the reduction of input to persons in category 1 resulted in a reduction in the total productive contribution from those persons in category 1, and that, despite the fact that the net productive impact of the existence of the persons formerly in category 2 would have become positive, it may be the case that the net result to society as a whole would be negative. That would be the case if the net increase of productive action of those persons formerly in 2 was less than the loss of productive action caused by the diminution of the amount of input allocated to the persons in category 1.

performed by the human individual increases, the biological strain on that individual is increased. At a certain point, the impact of increasing the amount of action performed by an individual in a given interval of time results in exponentially increased reductions to that person's health, as measured in lifespan. Therefore, in case 2 the ALS of 1a would decrease (especially since allocation of healthcare goods, which are part of the input, would not increase to 1a), and, thus, the average ALS and thus EM and P of the society as a whole would decrease.

Example 2:
-Change: Increase the input allocated to population sector 2 at the expense of population sector 1b. Result: Because the input originally allocated to sector 1b was that input which was required in order for 1b to engage in the productive action which resulted in the sustenance of the EM of the society at the original level for a given amount of labor, either the EM of the society will be decreased, or the action required to be performed by sector 1b will be increased in order to sustain the same effect. The effect of the later option is identical to that as would have been registered in the case of increasing the labor of 1a as was discussed immediately above. In either case, total EM and/or P of the society will be decreased.

Example 3:
-Change: Increase the input allocated to sector 1b at the expense of sector 1a.
Result: The result of this alteration is not as straightforward as the previous two examples, and it raises an important issue to be considered. Given a certain amount of action, what portion of economic input will be required by sector 1a to produce an equivalent output? Assuming this amount is attained, the possibility remains that, if 1a were to be allocated a larger portion of the input, the output which they were capable of producing would be greater. But how much greater? It may be an amount greater such that the ratio of total output to total input allocated to 1a is greater or lesser. The same applies to the effect on EM of increasing or decreasing the portion of input allocated to 1b. We can, therefore, see that, under a given PP and amount of labor, there is a function of for the amount of economic output or EM which sectors 1a and 1b can bring about respectively, given different amounts of economic input.



[Figure 21]

No input allocated results in no output. Increasing the allocation increases the output, but, after a certain point, the increase of allocation ceases to render any significant increase in the output.

Thus, the effect of increasing the allocation to either 1a or 1b at the expense of the other would need to be judged with this in mind.

This is the subject of "the diminishing rate of return" It will be taken up more at a later point in the report.

Another consideration must take place. Given that any reduction of input to 1a, operating at fixed levels of action, will result in a lower total economic output, the decrease in the total economic output will result in an inability to allocate the same amounts of goods to the population sectors for the next time interval. Some sector at T2 will need to have their allocation reduced below what it had been at T1. Assuming that the society avoids the highly entropic option of further reducing the input allocated to 1a, the following holds: If the input reductions are made to 1b, and, yet, the total EM of the society is either maintained or increased despite this, then the alteration of input was a beneficial one. If, however, the reduction in the allocation to 1b at T2 results in a lower EM for the society over the time interval from T2 to T3, then the change was of no benefit.

Example 4:

Change: Increase the input allocated to population sector 2c at the expense of sector 2a.
Result: The majority of population sector 2a are the elderly and young. Reductions of input to the elderly and young can take many forms: reduction of medical services to the elderly associated with increasing tendencies toward a medical culture of euthanasia; the reduction of services provided to youth, such as public school funding, reduction in access to services necessary to their development, and so on. Given that we have assumed that any increases of input to sector 2c would not improve the EM of the society, and that the reductions in services to 2a would all have the effect of reducing the EM of the society, the indicated change would result in a net decrease of the EM of the society.

We will not explore all of the various ways in which the distribution of economic input can be altered. The examples given should suffice to illustrate the conceptual basis upon which this report will proceed.

Economic Analysis

A good economist, like a good doctor, seeks to understand how to maximize the existence of the subject of his investigation. For a doctor, that is a patient; for an economist, that is the human species. Thus, in all considerations respecting the allocation of output into the various population sectors, the question in the mind of the good economist always remains the same: how will this affect the EM of the society? The consideration of how specific actions by a society -whether initiated by political processes, as in the case of economic policies, or whether brought about by other means, such as cultural initiatives- shape the distribution of economic input into those parts of society most appropriately correlated with the populations sectors utilized in our model, provides the basis for judgments respecting the effects which will be registered in as changes in a the EM of society and related economic conditions.

A Brief Note on the Morality in Economics

Respecting the allocation of input to the "overhead" sector of the population, namely, population category 2., this much must be said: In opposition to the utilitarian conception of economics which lies at the root of fascism, as expressed in the Nazi policy of "useless eaters" seen in Hitler's Germany, this author assumes that all humans have a right to the allocation of a certain portion of the input of society.

We will go further in affirming a conviction in the hypothesis that the moral commitments of a society are intimately connected with the actions which the society will take in the universe. We add to this basic hypothesis another, namely, that the moral commitment of a society conditions the behavior of a society in such a way that, should the moral commitment of a society fail to recognize the natural laws of morality which pertain to man in the universe, the behavior of that society will be such as to lead to its own destruction. The hypothesis can be restated thus: the moral commitment of society is just as relevant to the sustenance of the EM of society as are any of the previous factors mentioned; the discovery and assimilation of principles of moral law are just as contributive to the PEM of a society as are those discoveries of scientific or technological principle. Indeed, just as Douglas MacArthur, John F. Kennedy, Martin Luther King Jr., Lyndon

LaRouche, and most other people with any sense have recognized, the assimilation by mankind of the scientific discoveries of Albert Einstein has created the necessity of mankind assimilating the discoveries of principles of moral and spiritual law which implicitly preclude the practice of general warfare by societies.

On this basis, the following assertion is made: Any society which would accept the elimination (murder) of human lives on the basis of the net-negative economic contribution which the continuation of those lives seems to represent at some point, is a society which were doomed, by virtue of its lack of assimilation of discoveries of principles of moral law, to eventually cease to exist in our universe in which such laws reign.

Economic Growth

We will proceed to investigate how it is that the total output of a society might be increased or decreased over the course of successive intervals of time. This investigation is of relevance only because of its relation to the wish of the economist to know how "economic growth" occurs. We again make this relation explicit: In this report, we have adopted the EM as the indicator of the level of economic development of a society. Thus, the term "economic growth" refers, provisionally, to the positive change in the EM of a society over time. However, we have demonstrated that any EM attained by a society will depend upon the consumption of a certain array of valuable synthetic goods. Thus, we can readily correlate economic growth with certain changes in the output goods array of a society. Thus, by investigating how the economic output of a society might be increased, we investigate an important aspect of economic growth.

Increasing Economic Output

"*The annual produce of the land and labor can only be increased in two ways- by some improvement in the* productive powers *of useful labor, which actually exists within it, or, by some increase in the quantity of such labor."* -Alexander Hamilton

At an early location of this report, we noted that the universe which we inhabit seems to operate according to the principle that *nothing comes from nothing*. Thus, the only two methods which exist for increasing the total output of a society are those mentioned by Hamilton. We must either 1.) Increase the amount of product produced by the utilization of a given amount of input. Or, in other words, improve the productive powers of labor; or, in other words, bring about "scientific and technological progress." Or, 2.) We must increase the amount of input used for the production of the product in question. This includes increasing human labor.

Thus, if we find the output of a society to increase over a previous level of output, we must conclude that either of the two above mentioned options occurred, or a combination of the two.

Population Growth and Productivity

As the population of society increases, the total output must increase if the same level of per-capita input allocation (upon which the EM of the society depends) is to be sustained.

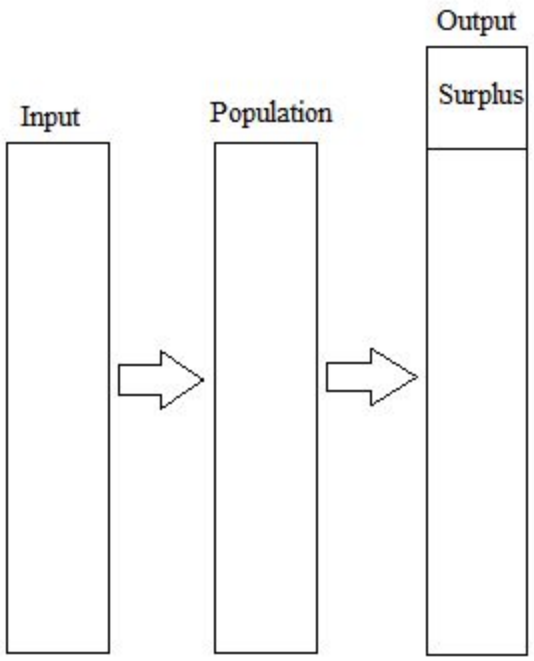
It should be noted that the accomplishment of an increase in the output of a society to maintain the same EM under growing population levels by the second method indicated above will not increase the P of the society; only the absolute size of the economy will be increased.

In the case in which the EM of a growing population is sustained through increases in output through scientific and technological progress, it should be noted that the P of the whole society, as that is defined above, will be increased. However, the average per-capita productivity will not be increased.

Ideally, under condition of a growing population, a society should achieve increases in economic output in both ways.

Modeling Growth in Economic Output

We now examine, by the use of our model, the case in which the economic output of a society is increased above a previous level of output (which was that society's input). The following diagram illustrates this case.



[Figure 22]

What is it That We Measure as Output/Input?

Here we come to a point of great importance. Heretofore, we have been considering the cycle of consumption and production in the case in which the input and the output are equal. There was a presupposition in this consideration- one which becomes more clear when we consider the question as to how we would model the cycle of production and consumption when the input and output are *not* equal.

Different things can be compared and judged to be either equal or not equal in two ways: either qualitatively, or quantitatively. Non equality in the qualitative sense does not admit of degrees of difference. Non equality in the quantitative sense does admit of degrees of difference. In order for two things to be quantitatively compared, they must be of the same quality.

Given that we seem to be quantitatively comparing the *amounts* of the input and the output, we ask the question: what is the distinct quality which the output and the input both share which enables us to compare them in a quantitative way? The input and output, we will remember, are collections of synthetic goods, specifically, the relevant array of synthetic goods. Thus, In order for us to compare the output and the input in a quantitative way, we must assume that the collection of goods in the input and the collection in the output are identical to each other in two ways. First, for each unique good in the input array, there must be a corresponding unique good in the output array. Second, the proportions between the amounts of each unique good in the input array must be identical to the proportions between the amounts of each unique good in the output array. If these two conditions are fulfilled, the output and the input can be considered of the same quality, or kind, and, thus, they can be quantitatively compared. The output might be less than, equal to, or greater than the input, in absolute size, but it cannot differ from the input in internal goods composition. In short, we must consider any differences in the output of a society with respect to the input as either *more or less of the same*.

Thus, if we consider a case in which the economic output is 10% larger than the economic input, we can imagine that every single synthetic good that was in the input available to society exists in the output in an amount 10% greater than that which it existed in in the input.

Later, we will examine the implications with respect to economic modeling which arise when we consider the case in which the internal goods composition of the output is *not* the same as that of the input.

Correlating Output With the EM

In order to determine if an increase in economic output actually represents economic growth, we must correlate the utilization of the output, or a certain portion of it, to the attainment of a certain level of EM by the society which does so. We will illustrate the ways in which economic growth and increasing economic output might be related in order to clarify the complexities involved in this investigation.

Assume the following: The economic output of a society is greater than that of the input. Further, imagine that the array of goods constituting the economic output of the society is *identical* to the array of goods constituting the input, besides an additional amount of synthetic goods of

arbitrary nature. We will denote this additional amount of synthetic goods (labeled "Surplus" in the above diagram) by A.

The subsequent utilization, by the society, of this economic output (O1+A) as input, however, leads to increases in neither the EM of the society over the next cycle of consumption, nor in the subsequent output which could, in turn, be used to increase the EM over the cycle of consumption after that.

A number of different situations could correspond to this first case. 1.) The synthetic goods in A were not of any potential net productive value under the current mode of consumption of the society. 2.) The goods in A were of potential net value if utilized properly by the society, but those goods were not used to any valuable affect. 3.) The goods in A were of potential net value to the society, *but only in the amounts already consumed by the society*.

We will proceed to explain each of these cases in order to clarify the reasoning behind them.

The first case is the most intuitively obvious. If the synthetic goods in A are hallucinogenic drugs, for example, the use of A by the society will not lead to an increase in the EM. In fact, depending on *how* those goods are used, the EM of the society might be decreased by the use of A. For example, if those drugs were used in the way they are most commonly used, the EM of the society would decrease. Even if an attempt were made to utilize those drugs for some net productive effect, the very act of attempting to do so would likely result in more of an economic cost than the economic benefit derived from that use. Sometimes, certain goods are of such negative net potential value that they are better just thrown away, which would be a cost, but a cost which is, sometimes, the least cost which a society could pay as a result of the existence of certain goods in its synthetic environment.[16]

The second case is not difficult to understand. The goods in A could have been used to the effect of economic growth, but, they were not. A tractor company might produce a unit on the order of a farmer, but, the tractor might be completely destroyed in transit to the farmer due to an unfortunate accident. Fresh food might be produced and stored in a refrigerator, but an environmentalist anarchist might unplug the fridge in order to reduce greenhouse gas emissions, resulting in all of the food rotting to waste. (As in the above instance, any use of goods requires consumption, which represent an economic cost. Thus, in order for the us of goods in A to have absolutely no net negative effect, they must be used to some extent such that that use contributed to the economy in an amount equal to the disposal of them.)

The third case reminds us of certain problems indicated in earlier parts of the report, such as the third example under the "Using the Model" section, and in the discussion of the nature of value.

[16] Upon consideration of what has been said here, the reader may have noticed that case 1 could not have corresponded to our example, for, if the goods were of no potential net productive value, then even their disposal would be a cost, and, thus, the EM would necessarily shrink to some extent even by their disposal. Thus, the society could not sustain the same level of EM in the cycle 2 that it had in cycle 1.

The economic value of any good is dependent upon the state of the total synthetic environment in use by the society in question. The ability for the utilization of a certain good to result in a net positive impact on the EM of a society is dependent also upon the total current process of consumption by a society of its synthetic environment. This applies to all goods, but, the principle is illustrated by using the example of increasing the amount of a certain kind of good already utilized by society.

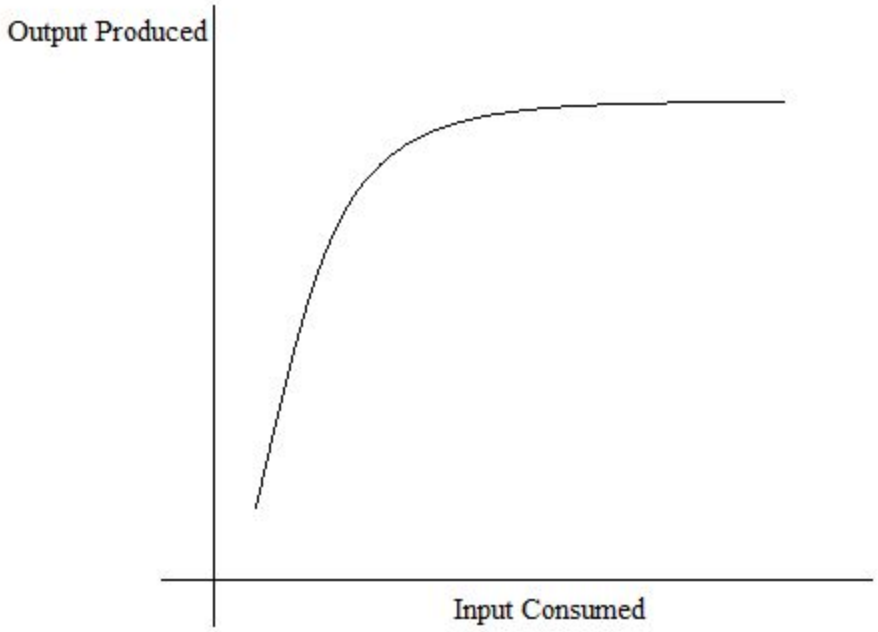
For example: Imagine that a society produces a certain amount of food which it consumes to the effect of sustaining a certain level of EM. Imagine, then, that the total amount of food which the society produces is increased. The consumption (assuming that the consumption of this food is in the form of *eating*) of this additional quality of food can result in 3 things: 1.) The increase of the EM of the society. This would occur, obviously, under condition in which the average individual in society suffered from some form of malnourishment. 2.) No change in the EM of society. This would be the case if the population already consumed all the food necessary to maximize their EM under the conditions in which they existed. Increasing food consumption might make the average person a bit heavier, with no appreciable effect upon life expectancy. The body of the average person might also simply increase its metabolic rate such that no changes in average individual weight or life expectancy were measured. Obviously, the additional consumption would need to be small in order for this to occur. And 3.) The decrease in the life expectancy. Obviously, if the average individual in society already consumed all the food necessary to the maximization of the EM, and, further, had already indulged in that consumption of food additional to that amount which does not contribute to their life expectancy, yet does not decrease it, then if, the average individual's consumption of food were to increase, then the average individual's life expectancy would decrease corresponding to a decrease in the EM due to negative health effects. A factory might be able to produce more product if it procures more machines. However, after a certain point, more machines will not help the factory produce more, and, in fact, the extra machines might eventually pile up and get in the way of the normal course of production, leading to reduced efficiencies.

This leads us to the fuller treatment of the problem of the diminishing rate of return.

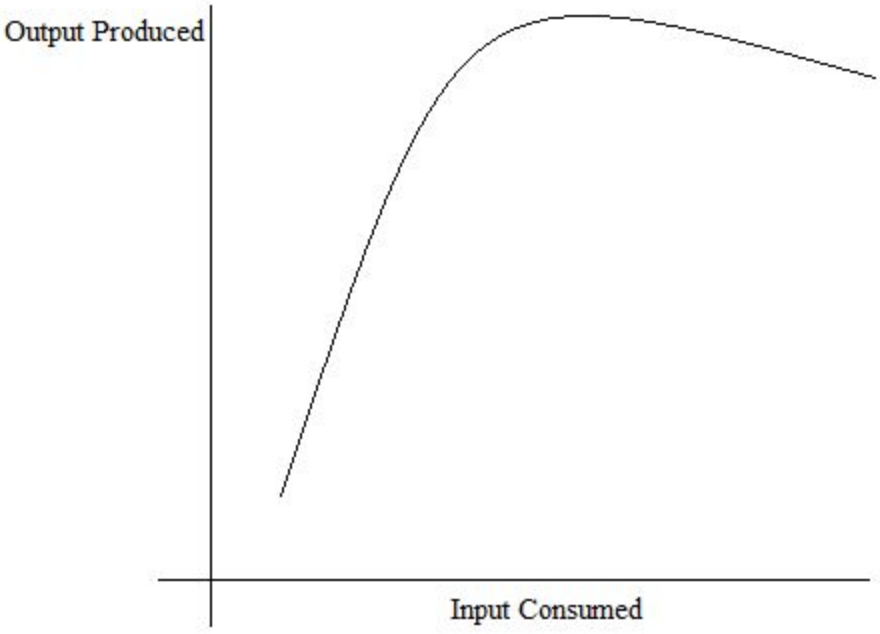
Maximally Productive Investment and The Diminishing Rate of Return

The Investment Curve

If we consider any process in which a certain input H is utilized to produce a certain kind of output J, we can construct a graph which represents the relation of the total input to the total output produced (over an assumed arbitrary interval of time). This kind of process in which there is a quantitatively distinct input/output relationship can be generally referred to as "thermodynamical." We will call the function illustrated below the "investment function."



[Figure 23]



[Figure 24]

While the investment function of most thermodynamical processes will be of the general form indicated in Figure 23, each thermodynamical processes will have a specific investment function

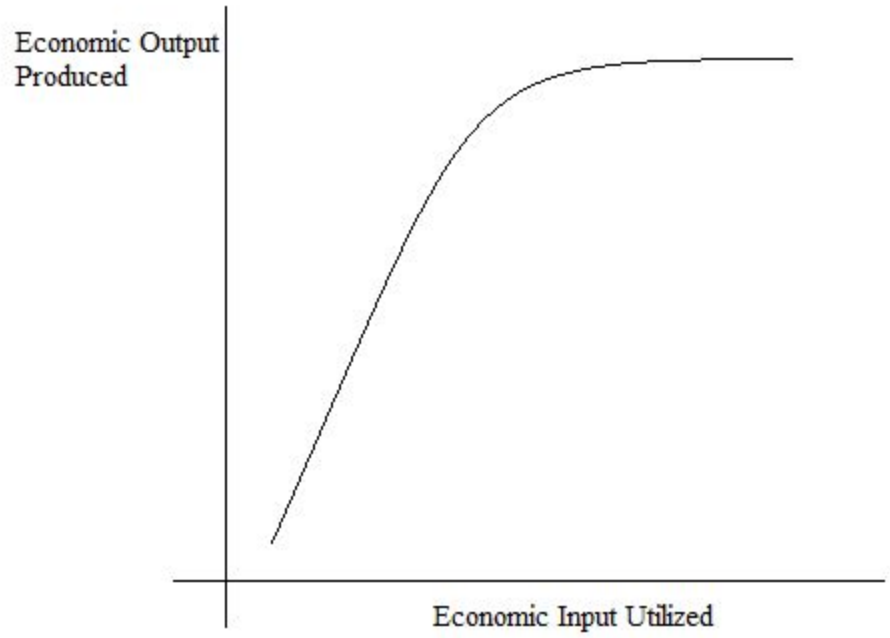
associated with it. As can be seen, generally, the production of any amount of output will require a minimum input. Increasing the input to the process increases the output more rapidly at first, but less so as the input is further increased. Sometimes the total output asymptotically approaches an upper limit, as in figure 23, or, the total output actually starts to decrease beyond the point at which a certain amount of input is utilized, as in figure 24.

If we examine the ratios of the output to the input at different points along the line in the graph, we find that there one point at which this ratio is maximum, beyond which, usually, the ratio begins to continuously decrease indefinitely. This phenomenon, in which increases of the input fail to result in increases of output to a degree proportional to previous increases in output resulting from previous increases in input, is called the diminishing rate of return.

The Diminishing Rate of Return

There are, in fact, two distinct kinds of investment functions, and corresponding diminishing rates of return (henceforth referred to as DRR), which are relevant to economic analysis. One is the DRR in the additional investment of goods in the production of other goods. Naturally, this kind of DRR can be extended to the economic input and output of the society as a whole. The other kind of DRR is that respecting the increase in the EM of a society given the utilization of an additional amount (over past consumption) of input by that society.

The Investment Function and DRR of Economic Output- Economic Input Relation: We have illustrated the case of goods production DRR in the instance of individual processes in a society. We can extend this to society as a whole. Thus, we can imagine that the relationship of economic input to economic output can be represented by an investment function like so:



[Figure 25]

It should be noted that, in figure 25, the line represents the highest potential output for a given input. This is necessary to point out because, obviously, the way in which a certain input is used will affect the resulting output which that utilization produces. The curve represents the output resulting from optimal utilization of the input, and the area under the curve all of the possible sub-maximal amounts of output capable of being produced for the utilization of the range of given inputs.

Imagine that the surplus goods aggregate A is a collection of exactly the same goods that were present in O1, but which is of smaller absolute size. That is, every single kind of good in O1, along with the proportional amounts of those goods relative to each other found in O1, is present in A, but, A is smaller in absolute terms. What will be the effect of the consumption, by the society, of A? What will be the effect of the consumption of "more of the same" by society?

The answer depends, of course, on the investment function for the society as a whole. If the input value of the society on the graph is below the input value corresponding to the point of maximal ratio of output to input, then the reinvestment of A Will result in an increase of the absolute output of the society, as well as an increase in the ratio of the output to input. That is, the productivity of the production of output will increase. (Assuming, of course that the magnitude of A is not so great as to make the economic input of the society correspond to a level that is so high that the resulting output is lower than before).

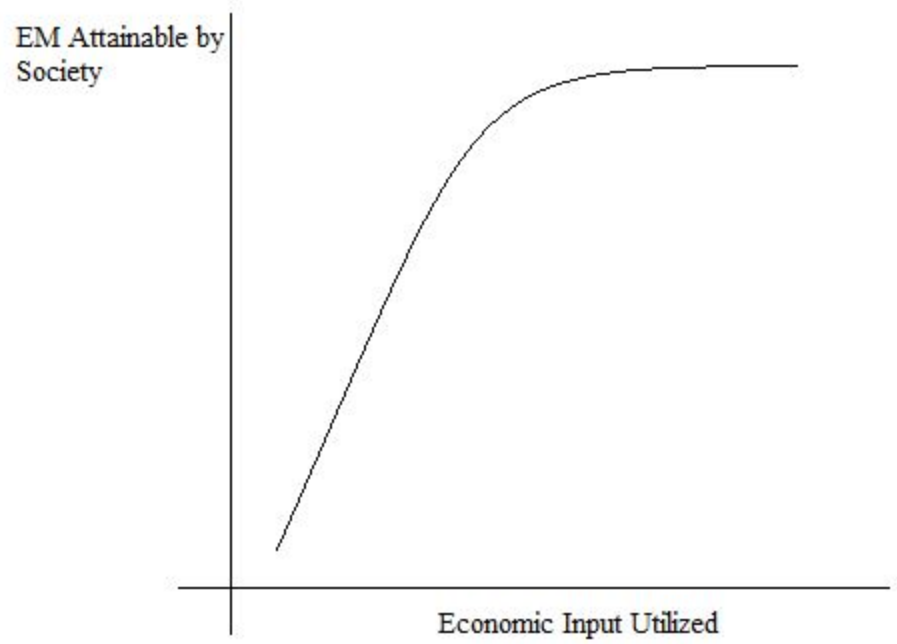
If the input value of the society is already at or above the input value associated with maximum output/input productivity, then the productivity, and perhaps the total output, of the society will decrease.[17]

Maximal productivity in the output/input relation of society is not always necessarily the objective to strive for. This is due to the fact that the investment curve of the input output relation is not necessarily the same as that of the input-EM relation.

The Investment Function and DRR of the EM-Input Relation: Just as we can correlate the amount of possible output generated by a society (existing in a fixed environment and exerting a fixed amount of action) given an amount of input of particular character, so too can we correlate the EM of a society with the amount of economic input of a given character consumed by it.

We can represent this relation as an investment function like so:

[17] LaRouche, in one of the demonstrations in his book "So You Wish…" tacitly assumes that the input value corresponding to the maximal output/input productivity is already reached by any society which might reinvest A. Leaving this point out might make it difficult, (if not impossible given a lack of pre-existing familiarity) for the reader to understand *why* the DRR must be overcome by technological progress. However, the conclusion which LaRouche arrives respecting that issue is valid.



[Figure 26]

Again, we note that, while this function might be similar to the economic output/input investment function, the two are not necessarily the same. The may be an instance in which one level of input i1 corresponds to the maximal productivity in the output/input investment function, while, at the same time, falling short of the input value corresponding to maximal productivity in the EM-input investment function.

Complications

This seems to create a paradoxical situation. For, assuming that a certain amount of input i1 corresponds to the maximal productivity of output/input, and assuming that an amount of input i2, which is greater than i1, corresponds to the maximal productivity of EM-input, we have the following: The input i2, can be created as output by the investment of i1. I2 is then consumed by the society, but, the investment of i2 will correspond to an output greater than i2 which becomes an input i3, and thus, the input i3 will be consumed by the society to produce another output greater than i3 and so on. However, this kind of process does not need to be carried out in this way. The level of output corresponding to a level of input on the output/input investment function only represents the amount of output that a society *could* produce given a certain input, not how much output a society *must* produce. Thus, if a society were to consume input i1 to produce input i2, which input corresponded to the maximal productivity on the EM-input graph, the society could reproduce i2 out of an input of i2. For, as mentioned, is the *manner* in which the input is used will determine the amount of output and the level of EM which result from that use.

How are we to determine what the optimal input/output relation for a society is? We recall that our goal is to maximize the EM. Thus, we should utilize that level of input which maximizes the

EM. However, since the EM seems to approach an upper limit asymptotically, there seems to be no finite input which allows for the attainment of any maximum EM. This, is, of course, a result of the way in which we have posited the EM and the level of input for a society are related. The reasons for that kind of correlation are sound, but, even if we were to imagine that the EM in the EM-input investment function either flatlined or began to decrease, the answer to the question would be the same as it would be if we assumed the EM-input relation is as we have modeled it.

The solution is as follows: The EM-input investment function is specific to a given amount of action. The curve will have different characteristics for different amounts of action. We can visually model this relationship in three dimensions if desired by adding another axis representing the rate of action. Increasing the rate of action might enable the same amount of input utilization to result in the attainment of a higher level of EM. But, we recall that the rate of action which can be performed by a fixed population will be limited. Further, we recall that, given the conditions of the synthetic environment within which the population exists, there is a certain upper limit to the rate of action which can be performed by the population before increases in the rate lead to reductions in the EM by virtue of the increased biological strain upon the population.[18] Thus, we simply find the point of highest EM in the three-dimensional manifold just described (EM, amount of labor, and total input comprising the dimensions), we identify the input value associated with that point. We then return to the output/input investment function, with the added dimension of rate of action, and identify, in that graph, the values of labor and input which correspond to the best attainable in the EM investment function. There will need to be a certain amount of mathematical balancing done, but, the optimal combination of the values of rate of action, input, output, and EM is, in principle, identifiable. This will be the point at which the P of the society is maximized.

With this considered, the question arises: If there is a maximum EM value attainable under a given quality of economic output, how does economic growth occur beyond that point? How does the EM of a society increase beyond that point? The simple answer is: technological progress. Technological progress also enables a society to overcome both the DRR inherent in a given output/input investment function, as well as the DRR inherent in a given EM-input investment function. Simple as this answer is, there are some complications involved with the representation of technological progress in our model. We will proceed to discuss those complications.

Conceptualizing and Representing Technological Progress

[18] It will be noted that the clause "given conditions of the synthetic environment" was inserted into this sentence. This is because the amount of action per unit time which a population can sustain before increases in the amount of action expended begin to reduce the EM is dependent, to a degree, upon the conditions of the synthetic environment. For example, the population in a modern society can sustain a greater amount of action per unit time than could the population of a society in medieval times, because the conditions in the modern synthetic environment allow for greater access to healthcare delivery, nutritious food, better protection from the cold and heat of nature with climate-control systems in the home, and a multitude of other things which contribute to the general living conditions better suited to the rest and rejuvenation of the body.

In order to represent anything quantitatively, the thing represented must be of a qualitatively distinct nature. Otherwise, no meaningful quantitative representation of the thing could take place. For example, we cannot attribute any quantitative relations to the concepts of brightness, or length, or weight unless those concepts each be of clear, distinct a quality which is susceptible to quantification. Specific instances of those things must be quantitatively comparable to each other. Therefore, the concept of length is such that each and every length can be quantitatively compared to all others. The concept of color, however, is not of this nature. We cannot say whether one color is greater than or less than another color. We cannot quantitatively relate red and blue. We might quantitatively relate the *brightness* of two specific instances of those two colors, but we cannot quantitatively relate the colors themselves. Similarly, we cannot quantitatively relate a collection of computers to a collection of watermelons, except in an abstract numerical way. That is, there is no amount of computers which we could ever collect which would ever equal any collection of watermelons.

Therefore, as pointed out earlier, when we established the quantitative representations of output and input for our model of the process of consumption and production in a society, we forced the reader to conceptualize the output as of the same quality as that of the input.

For a given output equal to the input, there was added a batch of surplus goods A. A could be considered as either *more of the same* goods which already existed in the original input. If we assumed that the goods in A were exactly identical to the goods in the original input, and that the proportion of goods in A was also exactly identical to the proportion of those identical goods in the input, then the output could be considered as *greater than* the input. For, since the output was a collection of identical goods in identical proportions to each other as found in the input, the only difference between output and input would be one of quantitative relation, or size. However, what if we were to conceive of the additional batch of goods A as different from the goods found in the input? In that case, *we would not be able to represent the original output as having increased, decreased, or remained the same* (if the goods in A were considered part of the new output). For, the new batch of goods, if considered a part of the new output, makes the new output qualitatively distinct from the original input. There is no longer any way to quantitatively compare them to each other, at least respecting the quantitative relations of their arrays of goods. True, we can compare the amounts of some of the goods in each that are identical, but, we can no longer quantitatively compare the output *as a whole* to the input *as a whole*, in any meaningful way.

Thus, we are not able to represent an output of one quality within the same manifold in which output of another quality is represented. We must create a new manifold to represent the relation of input and output, as well as the relation of input and EM, given an alteration in the goods comprising the output.[19]

[19] It the problem of representing qualitative changes in economic output, which, I suspect, captured LaRouche's imagination and induced him to look into the work of mathematicians who investigated the characteristics of manifolds, in hopes that someone may have discovered a way to represent processes which change qualitatively in some conceptually continuous way.

Comparing the Value of Differing Qualities of Output.

While outputs of differing quality cannot be quantitatively compared with respect to their magnitude, or size, they can be compared with respect to their value. Since each quality of output will have a manifold of possible quantitative relations to the EM (when utilized as input), the question arises as to how we might determine which qualitatively distinct kind of output is more valuable. The way in which this is done is to examine the maximum EM value attainable by a society by utilization of that kind of output. As mentioned, this value is locatable within the three dimensional manifold, the dimensions of which are EM, ate of action, and amount of input of a certain kind.[20]

In Search of a Measure Capable of Being Put into Correlation with the EM of Society

Given the demonstration that it is not possible to represent qualitative changes in the economic output of a society, the question arises: Are there any measurable values which we can correlate with changes in the EM of a society? Indeed, there are. Available records indicate a close correlation of a number of different physical measures with changes in the EM over time. One of them, similar to Vladimir Vernadsky's measure of the "biogenic migration of atoms" (which he puts into correlation with the development of the earth's biosphere), is the total mass (in Kg for example) of synthetic goods contained in the economic output of society. This value is seen to closely correlate with the changes in the value of a society's EM, and that in such a way that the total mass of synthetic goods generally increases in conjunction with increases in the EM value, and decreases in conjunction with decreases in the EM value. Another quantity which is closely correlated with changes in the EM in this way is the per capita, and/or per square kilometer, value of the total energy produced by the society over a given interval of time. That is, the density, relative to population and/or land area occupied, of power generation of the society.[21]

The correlation of these measures with the EM value of a society is intuitively appropriate to us. For, we consider the increase in the EM of the society to indicate the level of mastery which a society has achieved over the universe; and, thus, it seems intuitive that the total mass in the universe processed by a society will increase as its mastery over the universe increases. Similarly, we find it intuitively appropriate that the total energy consumed, which is a measure of physical work performed on the universe by the society, would increase as the mastery of that society over the universe increased.

There may be other measures besides these two which correlate to the EM of society in the same way. However, these two measures are quite general and are, therefore, judged to be more reliably correlated to the EM value of a society than other measures which might be more specific and liable to diverge in their correlation to the EM under changing circumstances.

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[20] Such an identified value might be called "meta-value" since it is not the value of a single good, or even of an the entire aggregate of goods, but a measure of the potential value inherent in a certain kind of goods array.

[21] This measurement is interesting in that it is the same measurement which is correlated to increases or decreases in the capability to effect physical changes other than the increase of the EM of a society.

But, while it is true that these two measures are closely correlated with a society's EM, a world of caution, perhaps already obvious to the reader, will be offered: As we know, correlation is not causation. Thus, we cannot conclude that by increasing power density, or the mass of economic output, the EM of a society will necessarily grow as a consequence. Hypothetical cases, and probably some actual cases, in which the power density and total mass of output were increasing while, at the same time, the EM of a society was decreasing, could be found. We must remember that such measures as these can only be regarded as the *effects* of those processes which actually *cause* the EM value of a society to be changed or sustained. They are effects which may lie in close conceptual proximity to such causes, and, thus, they may act as useful indicators of the processes which are the most contributive to the EM of a society. But, they are only indicators of that kind, and never could be anything more.

Further, we cannot assume that these measures will always correlate to the EM of human society into the indefinite future. Further still, it may be found that our current conceptions of these physical characteristics will undergo revolutionary changes; changes which render these concepts incapable of metrical correlation in the way we currently consider those quantities to be capable of. That is, the concepts of mass, energy and so forth, may undergo such radical transformations in the future that we no longer could consider meaningfully measuring them in the way we currently try to do, or, from the standpoint of the operationalist, that we would no longer find significant the kinds of measurements which currently define those terms.

Generally, there is no measure which we can rely upon which can tell us whether an economy is growing or not other than the EM itself, for economic growth is defined as increases in the EM. However, even the EM is not the ultimate measure of whether the perpetuation of the human species is being facilitated. We can always conceive of cases in which the EM increases, while the basis for the perpetuation of the species is being decreased. For example, the process of "economic self-cannibalization" can be represented as an increase in the EM simultaneous with a decrease in the PEM. The EM, however, can suggest, as the other measures, those processes which do perpetuate the human species in the universe.

The Three Kinds of Change in Output

A subsequent economic output of a society (O2) can differ from a previous economic output (O1) (that is, the input utilized to produce it) in three ways.

OC1: Identical Goods and Proportions, Different Absolute Quantity

This case has already been elaborated upon. It is the only case in which the economic output of society can be said to differ quantitatively from the economic input of that society.

An example of this would be an absolute increase by a society of the production of every single good by the same proportion.

OC2: Identical Goods, Different Proportions of Goods

This case is that in which each unique good in O1 is present in O2, but, the proportions of the amounts of each unique good in O1 are different from the proportions of the amounts of each unique goods in O2. In this case, O1 and O2 are not quantitatively comparable.

An example of this would be a society which produced an output identical to the preceding one besides the fact that they produced more of a certain kind of good, like cars, in the output.

OC3: Not-Identical Goods

This case is that in which each unique good in O2 is not present in O1. In this case, O1 and O2 are not quantitatively comparable.

An example of this would be a society which produces an output identical to the preceding output, except for the addition of a new good which had never been produced before. This could be economically beneficial, as in the case of technological progress, or deleterious, as in the case of a failure to reproduce certain economically valuable goods in a previous level of output, or in the production of a new good the consumption of which was economically deleterious.

These different kinds of changes in output will be referred to as Output Change 1, 2 or 3 respectively. (OC1, OC2, and OC3).

The DRR OC2 and OC3

We have already discussed the DRR for OC1 above. For completeness, we will briefly examine the DRR as it relates to OC2 and OC3.

In the case of OC2, O2 can be represented as O1+A. By our definition of O2, A can be any amount of any of the individual goods in O1. It is would seem to be the case that the point at which greater increases of reinvestment of output in the fashion of OC1 will no longer yield any benefit is a point at which the additional margin of goods invested, A, can yield a benefit if the goods in A are identical to those in O1 but present in different proportions. For example, if a society already produced and consumed enough food to sustain everyone in the healthiest possible state which food can contribute to sustaining, then the production of more food to be consumed by the society would be of no benefit. It might be said that the society had already reached the “saturation point” for that particular kind of good (food). However, if a certain amount of life-saving medicine were produced in O1, but in an amount not sufficient to deliver its benefits to all of those in the society who needed it, then that society would benefit from an increase the amount of that kind of medicine produced. Thus, the additional margin of goods, A, should contain, in this situation, a much larger proportion of that medicine to food than was present in O1.

Continuing in this fashion (OC2), the society might continue to derive benefits from the reinvestment of amounts of economic output in excess over their previous levels. However, as each of the goods which, due to deficient amounts were found beneficial to be produced, were

reinvested in greater quantities, similar "saturation points" for each of those goods would be reached, after which the increase of the production and consumption of those goods would no longer result in any economic benefit. Continuing in this fashion, the society would eventually reach a saturation point for all of the different goods available to it at the beginning of the process. Clearly, reverting to surplus reinvestment in the form of OC1 would not be of any use in this situation either. In order for a society in such a situation to effect any economic improvement, it would need to resort to surplus reinvestment consistent with OC3, particularly the OC3 of technological progress, wherein new kinds of goods are invented and introduced into the process of consumption and production in an economically profitable way.

The concept of DRR is, of course, not applicable to OC3.

More Considerations: DRR and the Different Parts of the Economy- Population Sectors, Individuals, Production Firms

So far we have only considered the DRR of societies as a whole. We can apply the same reasoning about the DRR to the goods allocated to the various population sectors. We can also consider the DRR of goods allocation to individuals, as well as individual production firms.

There may be imbalances in the resource distribution of the economy such that maximum productivity is attained in some parts of the economy while other parts are left without the allocation needed to be maximally productive. In the discussion above respecting the DRR for societies considered in the large, we tacitly assumed that there were no imbalances in the distribution of resources- that is, that the resource distribution was that which was optimal, and that given this optimal distribution, a certain investment function and DRR would be implied. Further, it was explicitly assumed that the *way* in which the allocated goods were utilized by the population was the most productive way in which a population, operating under a given array of discoveries, could utilize such a collection of goods. This is, of course, a fantastic hypothetical situation- we know that the real world is far different in these respects. However, the elaboration of the concept of the investment function and the DRR above which assumed these facts is still valid and heuristically useful in the theoretician's consideration of the economic process. The idealized investment function and DRR for a society as a whole can be adjusted to take into account actualities which necessitate a divergence between the theoretical and actual in a given context.

The Origin of These Complexities

The complications which we have addressed under the obligation of thoroughness should be briefly clarified with respect to their origin. The origin of these complications arises from the kind of idealized model which we have adopted for the representation of the process of the production and consumption of economic output. The model obliges whoever utilizes it to conceive of the economic output of society as a *totality*, as a *one*. That is, when using the model developed above, there is no need to consider the economic output on the basis of each individual good comprising it. This affords the theoretician certain advantages, such as the ability to quantitatively analyze the changes in output. But, it also creates certain difficulties,

such as the inability to represent changes in the goods composition of the economic output of the society, at least within the same representative manifold. If the goods produced and consumed by society were to be represented not as an aggregate, but as a collection of parts, some of these complications might be avoided. Indeed, the model which has been utilized up to this point may prove to be of only elementary heuristic value, while more advanced considerations of economic production and consumption are to be based on comprehensive representations of economic output with all of its parts individually considered.

VI. Money

Money: The General Concept

The word “money” signifies whatever is generally accepted in a society as a common medium of exchange for those things which are found desirable by the members of that society. Previous to the modern era, it was common that the only things which society would accept as a common medium of exchange for desirable things were things which were themselves desirable. Such things were often desirable because of their scarcity and pleasing sensual properties. Gold, silver, sea-shells, and beads are examples of such things which, on the basis of their desirability deriving from sensual appearance and scarcity, have acted as money in societies throughout human history. Contributing to the aptitude of the use of these things as money were their other characteristics like durability, divisibility, and ease of identification. Transportability was another characteristic felicitous to the use of a thing as money. This characteristic is made more important when present in combination with the subjective characteristic of high relative desirability; for this combination allows for the relatively easy transportation of high amounts of “purchasing power." On the other hand, other things which have been used as money were desirable not on the basis of sensual appearance, but on the basis of their functional use; examples being corn, wheat, and cattle. Often, however, these things would not be found as fitting to be used as money as the previously mentioned things, by virtue of the lack of some of those special phenomenal characteristics above mentioned.

From time to time in the course of human history, some society would discover the great advantages of using something as a representative of the common medium of exchange. Something, such as a piece of leather, or paper, which itself was of no desirability whatsoever, would be adopted to represent the desirable thing comprising the medium of exchange for that society up to that point, generally as a legal claim to some amount of it. Thus, a large amount of some desirable thing previously playing the role of money would be put into a vault, and the representatives of (or claims to) certain portions of it would be distributed in the form of the new, worthless things like pieces of paper or leather.

Upon the establishment of such systems of “representative money", it became clear to people that, over time, the acceptance of the representative thing as money by the society no longer had a basis in the understanding of the people of the society that possession of the thing represented a legal right to claim a certain amount of a desirable thing in a vault somewhere, but, rather, that the basis for the acceptance of the worthless items as money was simply social habit, or, custom. Once such an acceptance is concretized in a society, the basis for the creation of new amounts of

money, made out of undesirable material and not providing the right to claim any other specific desirable material, is laid. True, some people discovered that those in positions of power could simply legislate the acceptance of a thing as money, even if the legal right to claim some desirable thing by it were completely removed, and that, thus, new amounts of money could be created. Regardless, in the absence of such legal compulsion, the force of custom provides the basis for the acceptance by a society of otherwise worthless material as money. Indeed, today it is the case that for the entire life of the majority of the people living on this planet, most, if not all, of the developed nations of the world have utilized money which has no legal exchangeability for a certain amount of gold, silver, sea shells, or any other desirable thing stowed away in a vault somewhere.

National Money, or, Currency

Today, the money created by governments, or their agencies like central banks, is known as the *national "currency"* of the country the government of which created it. Barring massive failures in monetary policy by governments, this "national money" is widely and firmly accepted by the people living under the jurisdiction of the government which creates it- that is, the people living in the country the government of which created the money. People living in countries other than the one in which a particular national currency is created may also accept that currency as money. This, for the most part, depends upon whether or not it is believed that the currency will be accepted by people outside of the country where that currency is adopted as the national currency, or whether there is a wish to procure some of the desirable things which are sold within and/or from the country where that currency is adopted as the national currency.

However, in this report, we will not take up an investigation of international monetary processes, or even international trade. The principles of economics and money which we wish to elucidate here are best illustrated by the case of the hypothetical self-contained society. Once the principles which we seek to communicate are recognized in that context, the basis is laid whereby those principles can, with great felicity, be extended to considerations of international monetary and economic processes

The Basic Relation of Money to the Economic Process

The use of money in an economy provides the basis for a much more efficient distribution of valuable goods than would otherwise take place. Just imagine if everyone had to barter individual goods or services for everything they needed, or if one central authority in a society were responsible for all goods and service production distribution without any use of money. But, we will not discuss this aspect of the economic benefits of money as a good, or technology; others have written extensively on that. We will consider the role of money as a medium of exchange, and the way in which money, in that role, can influence the economic process.

The most basic influence which money has on an economic process is the way in which it determines the allocation of economic input to the various population sectors. This is assuming that most of the goods constituting the economic input/output of a society are only able to be procured by an individual through the exchange of money for them; that is, most of the goods

constituting economic input/output are only able to be procured by an individual by "purchasing" them. Thus, if an individual has no money, then they will not be able to procure most of the goods which they require to survive, unless, of course, those goods are purchased for them in some way, or they resort to criminal activity. Conversely, the more money an individual has, the more economic input/output they are able to consume.

Thus, returning to our diagram (Figure 20) of the allocation of economic input to the various population sectors, we can say the following: Generally, the proportions of the parts of the total economic input allocated to the various sectors of the population will be determined by the amount of money spent by the individuals in those sectors, and, also, the amount of money spent in the procurement of valuable goods on behalf of those sectors in some way. An example of money being spent in the procurement of valuable goods on behalf of a population sector would be government spending on education, healthcare, infrastructure and other things which are then given to the different population sectors.

Return to Figure 20 (below) which illustrates the allocation of economic input to the various population sectors.

If the total allocation to population sector 1a is increased, this effect could correspond to a number of different alterations in the monetary processes of the society. It could mean that the wages of the individuals working in that sector were increased; that the taxes upon the income of that sector were reduced; that the government initiated the construction of new infrastructure projects, which increased the number of people in that sector; and so on.

Similarly, the diagram provides us with a way of thinking about what will happen when certain changes in the behavior of a society occur.

To make one further and obvious point in this vein, it is the case that, in general, the amount of money which an individual will spend will be greater or lesser in proportion to the total amount of money which is owned by that individual (or thought to be owned by that individual). Thus, we can say that, generally, the amount of total money owned by an individual determines the amount of input which is allocated to them over one cycle of consumption and production. However, the total money owned by that individual might not be all spent over the course of that cycle of production. This is true, but it is still the case that the total money owned by an individual represents some amount out output which they can claim at some point of that individual's choosing, and, therefore, generally, the greater the amount of money a person owns, the greater the total amount of economic input they will consume over time.

A Brief Note to be Made

Before continuing with this line of investigation, we must address something which may have caught the eye of some readers. It was said above that *most* of the goods constituting economic output can only be procured by purchases with money. It is true that it is only *most* goods and not *all* goods, because, obviously, an individual may produce and something which is of real economic value which that individual never intends to sell for money, but, rather, wishes to use

themselves, or give to someone else. It seems appropriate, in a modern economy, to judge the portion of goods of this type in the economic output as very small in proportion to the rest of the output. Further, it seems that the proportion of such "not-for-sale" goods, to the proportion of "for-sale" goods in the output would be reduced as a society advances to higher levels of economic productivity, corresponding to increases in the complexity of the process of economic production and consumption, as indicated by increases of things like the division of labor.

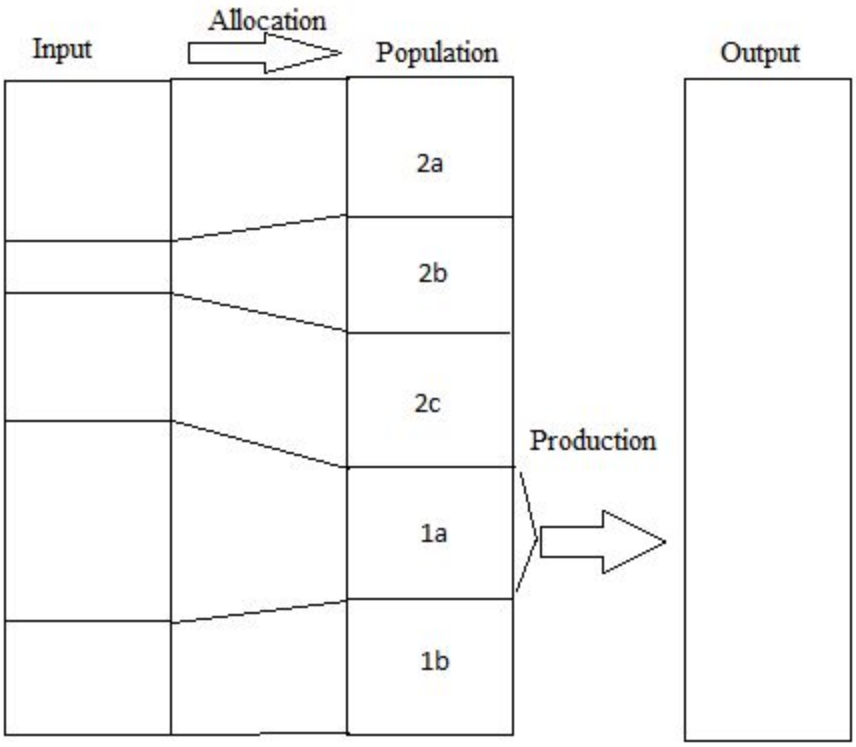
A Fundamental Question of Economic Analysis and Money

It will be recalled that, earlier, we presented a question of fundamental importance for economic analysis; we ask, respecting anything in the economy which consumes a portion of the input: Is that process of consumption one which causally contributes to the sustenance and/or augmentation of that the current levels of economic output and/or EM of that society, or, is that process of consumption one which does not causally contribute to the sustenance and/or diminution of that society's current level of economic output and/or EM?

Given the identified relationship of monetary processes to the economic process, we can apply this question to the monetary process: Will a change in the allocation of money to the different population sectors of society result in a change of economic input allocation, a change the consumption pattern of society, which contributes to the increase or the decrease of the EM and/or economic output of the society?

Inflation/Deflation

Take another look at the diagram which represents the allocation of portions of total economic input to the various sectors of the population:



[Figure 20]

As discussed, the amount of money which is spent in the procurement of input for the population sectors determines the amount of input each sector will receive. Using our model, we can conceptualize this process as follows: We imagine that all of the input is completely consumed over an interval of time. Thus, the consumption of the input can be correlated with an amount of money which was spent over that time interval. Thus, we can imagine that there is an average price per unit of input for the time interval examined. We imagine that the level of output resulting from the consumption over the interval is the same as the level of input. We then ask, what if, in the second time interval, every purchaser in the society was given twice as much money to spend as they spent in the course of the first time interval? Essentially, nothing would happen. For the total available input would be precisely the same as it was at the beginning of the first time interval, and the proportions of the total amounts of money available for spending on the population sectors would also be identical, and, thus, no alteration in the allocation of economic input would take place. The only thing which would occur would be that the per unit price of economic input would be doubled. The increase in the price per portion of available input is called inflation. Deflation can be thought of in a similar way. Given a level of available input, does the total amount of money used for purchases decrease? If so, then deflation will result.

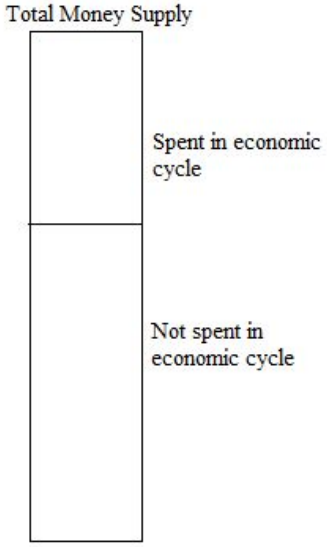
Some readers might ask how we are to account for the possibility of a response by the goods producers in an economy with higher rates of production given greater “demand", or, rates of purchase, if the money spent increases. Indeed, the output of a society might increase in response

to such increased spending, however, inflation occurs when the total amount of money spent in an economy increases faster than the total amount of available economic input increases. There are other complications to be considered. We could only assume that all of the goods in society would increase their prices in identical proportional to one another if all of the production *response capacities* were identical for each production firm in the society. However, the response capacities of the various firms in an economy are not the same. Thus, inflation does not occur in such a neat way as in the hypothetical situation described above; sometimes different kinds of goods increase or decrease their price at different rates because the response capacities of the firms involved in the production of those various goods are different.

A Complication

The complication arising from the fact that not all of the money which a person owns is spent over the interval of time corresponding to the cycle used in our idealization can be treated in two ways.

First, we can divide the bar representing total money supply into that which is spent over the cycle of production and that which is not spent like so:



[Figure 27]

This allows us to asses the potentials for inflation and deflation inherent in the variability of these portions of the money bar over different cycles of production. For example, if, in one cycle of consumption a certain amount of money is used out of the total owned money supply to purchase the total output available, then, if that amount increases (to the same extent that the not-spent portion of the total money supply decreases), and, if the next output is of the same size as the previous one, then the per-unit output price in the second cycle will be higher than that in the first. This also provides a tool for considering the effects of banking and other financial operations in an economy.

The second way in which this complication can be treated is to ignore it in order to reduce the complexity of the elaboration of the heuristic model we have developed. To do so is justified if it does not significantly alter the conclusions drawn from utilization of the model with the complication considered.

A Further Complication

It will be recalled that there are two investment functions, and two corresponding DRR's, for a given society, One is the actual, and one is the theoretical. The theoretical, as it was developed above, assumes the resource distribution and utilization of the society is maximally productive. That is, it assumes that everyone in the society is Jesus Christ. The implication of this assumption respecting the use of money in the society is this: no matter what variations in the amounts of money which the different people in a society own, the total economic process, as registered in the EM and the goods production of that society will be the same. Why? Because, if we assume that a society allocates and utilizes its valuable goods in the most productive way possible, we must then assume that the use of money corresponding to that.

We know, however, that not everyone in a society is Jesus Christ. Thus, not only will the allocation of input to the different population sectors be of significance to the economic process (as illustrated above), but the allocation of money will be of significance. There are two considerations involved: 1.) Are the goods allocated to an individual or group of individuals put to the most productive use? 2.) Is the money spent or distributed by an individual or group of individuals used to procure goods which are capable of being put to productive use? If we assume that everyone in society is Jesus Christ, then the answer to these two questions would be yes. If we assume that not everyone in society is Jesus Christ, then the two questions would need to be taken up on a case by case basis. It must also be recognized that the answers to these two questions will be different when applied to an isolated individual and different sizes of groups of individuals.

Money spent on the procurement of non-valuable goods obviously represents a net loss to the society, for the money will be allocated to people who produced nothing of value, but who will then be able to purchase a portion of the valuable goods and of the society with the money they have so procured. An example of this would be money which is spent on narcotics. Money spent on valuable goods directly which are misused is a loss to society. Money spent on decadent services, such as prostitution, puts money into the hands of persons who make no productive contribution to society, yet which can purchase valuable goods and services on the basis of the money they have so procured. And so on.

The moral qualities of the individual, who is in possession of money by which he or she lays claim to the valuable goods produced by society, will largely determine to what productive or nonproductive effect that person's use of money, and allocation of goods, will be. Based on this supposition, we can prudently assume that, on the average, the morality of the mode by which an individual procures money will be coherent with the morality of the way in which that person uses that money. We would expect, therefore, that someone who procured a large amount of money as a Wall-Street drug-money launderer and/or speculator would be more prone to

economically irrational profligacy in their use of their money, than a hard working industrialist who, by virtue of innovative and sustained efforts to bring about the production of economically valuable goods for society, was able to procure the same amount of wealth. The latter, for example, will be more prone to philanthropy, while the former will be more prone to indulgences in savagely decadent activities.

Thus, the changes in the distribution of money to the various layers of a society can be considered with this in mind. Identical changes in allocation to different layers do not necessarily result in the same economic effect.

The Demand Function

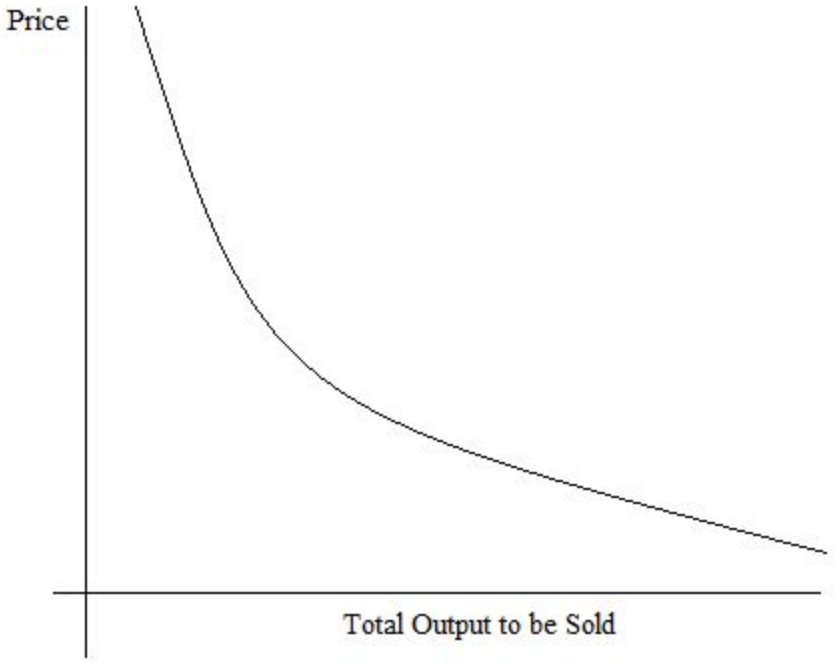
The "demand function" is, the per-unit price of a good which allows a certain number of that good to be purchased by the society over an interval of time; or, how cheap a good must be in order for a certain quantity of that good to be sold on the market over a certain interval of time. Demand functions can be attributed to one single kind of good, or they can be attributed to an entire economic output.

We will examine the demand function which is the price per unit output which a society is willing to pay for a certain kind of output. This demand function can be represented with the price being a function of economic output quantity.

The demand function does not correspond to any specific kind of system of economy, except that the system it corresponds to uses money. That is, the demand function can represent the price relation to output quantity in economic systems of very different natures. Whether an economy operates on the basis of a free market system, or a system with major governmental involvement in the allocating resources, a demand function will exist for each one.

It is not inappropriate to assume that the demand function of a society for quantities a given kind of output will correlate to the EM-Input investment function. Though this might not always be the case. The degree to which the demand function of a society for a given kind of output does not correlate to the EM-input investment function is the degree to which the demand function of that society is economically irrational.

The demand function can be represented by a graph like so:



[Figure 28]

The "Buy-Back" Problem

We must here examine something referred to as the "buy-back problem." The problem is posed in the following way. Assuming all of the money available in an economic system for purchase of the input is utilized in the purchase of the input by the various population sectors, that amount of money will be insufficient to purchase any amount of output which is in excess of the original input. In other words, if the money in an economic system is what is required for the purchase an input I1 by the population, then that amount of money will not be enough for the population to purchase all of the next output O1 if that output is greater than I1; that population will not be able to purchase what we indicated above by "A." On the basis of this reasoning, it has been stated that in order for the margin of output, A, which is in excess of input I1 to be purchased, additional money will need to be introduced into the economic system.[22]

An initial approximation of an adequate response to this problem is as follows: In the case above mentioned, there is no need to conclude that the money available in the system will not be sufficient for the purpose of purchasing the entirety of the new output. This is easily recognized by considering what was said above regarding inflation and deflation. If the total output increases, and the total amount of money owned by the population sectors which is to be used for the purchase of that output remains the same, the effect will be a lowering of the price of all of the goods in the output to the extent that the amount of money available for purchases is capable of purchasing them- assuming, of course, that the extra goods are still demanded in the same proportions by the society. Thus, no additional money will need to be introduced into the system in order to facilitate the consumption of these goods.

[22] Lyndon LaRouche makes this argument in chapter 7 of his book "So You Wish…"

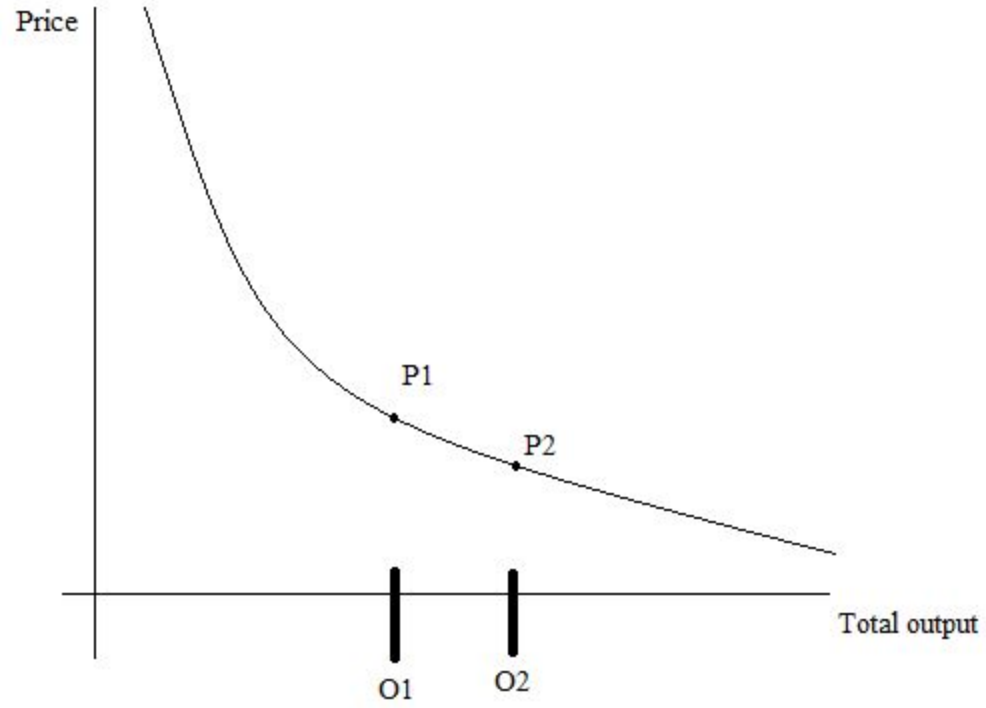
But, in order for us to meaningfully address the essential issue at the core of this problem - namely, of how additional levels of output can be distributed to the population sectors of society on the basis of purchases with money- a number of considerations must be made. This problem can be demonstrated as a pseudo-problem under certain conditions, but also a theoretically legitimate one under other conditions. The primary things to consider with respect to this are 1.) the nature of the surplus output A which is produced; and, as indicated in the clause near the end of the last paragraph 2.) the demand function of a society for a certain array of goods under different conditions, including as that might be correlated with the EM-input investment function.

The first consideration leads us back to the issue of the three different ways in which the output of a society can be changed, namely, OC1, OC2, and OC3.

OC1 Buy-Back

First, let us examine the buy-back problem in the case of OC1; that is, the case which the additional margin of output, A, is of the same quality as the input, such that we can say that the output quantitatively increased.

The new level of output will correspond to a location on the horizontal axis of the demand function graph, which, in turn, will correspond to a price.



[Figure 29]

We will call the price per unit of output given by the demand function the "demand function price" (hereafter abbreviated as DFP).

As mentioned above, in order for a different of output to be purchased with the same amount of money, the price per unit output will need to decrease or increase in proportion to the increase or decrease of the output over the previous level. We will call this the "Inflation/Deflation Price" (hereafter abbreviated as IDP)

If the IDP is below the DFP, then the goods will be purchased, and no need for additional money to be put into the system would arise. If the IDP is above the DFP, then the goods will not be purchased unless there is a reallocation of money, or a new quantity of money introduced into the system for the purpose of facilitating the purchase of those goods.

A Note

As mentioned before, the demand function is not necessarily economically rational. A certain amount of output might be closer to the optimal amount (identified in a previous section), yet still be correlated to a DFP which is below that amount of output's IDP. That is, even though an amount of input which could be closer to the economically optimal amount of that kind of input, that amount might not be one which the society would consume, under current practice, even if given the opportunity to do so. In this case, various measures can be taken by the government to facilitate purchases for the productive employment of these goods. Money can be siphoned out of the processes which facilitate the purchase of those parts of the output which are of no use, and put to more productive employment. This requires no additional money to be introduced into the system. Or, a new amount of money can be introduced into the system in the form of the purchase of these goods. The propriety of this is determined by whether the goods are put to the proper productive use which enables their addition to the consumption of society to improve the economic conditions of the society. It could be said that these measures would be simply changing the demand function of the society; indeed, that is what they do.

OC2 and OC3 Buy-Back

To begin with, let us take an example of OC2: Imagine that the total output of a society O1 contains a certain amount of good X. Imagine that the money available for purchase is all utilized in the purchase of O1, and that 10% of this money is utilized to purchase the amount of X in that output. Imagine, then, that the next output, O2, is exactly the same as O1, except for the addition of a margin, A, which is made up entirely of good X. Imagine that this amount of surplus X is equal to the amount of X in O1 (which is O2-A). That is, imagine that O2 contains twice the amount of good X, and equal amounts of every other good, that exists in O1.

In this case, an across the board decrease in all prices of all goods is not possible in the same way as illustrated above in the case of OC1. To enable the amount of money in the system to absorb the new margin of X in the indicated amount a number of different price variations could take place. Either the price of X could be reduced alone, the price of all other goods besides X could be reduced, or, both the price of X and the price of all of the other goods could be reduced in the

same proportion, or in different proportions. We exemplify the first three examples for our above indicated case, respectively, as follows: The price of each unit of X can be decreased by 50% while the prices of all other goods in the economy remain constant. The price of all goods other than X in the economy could be reduced by about 11%, while the price of X remains constant. Or, the price of all goods in the economy, including X could be reduced by about 9.1%.

The kind of adjustment exemplified by these three cases, that is, the lowering of prices to enable the same amount of available purchase money to purchase O2, involves some complications. One of these complications is the issue of the profitability, of the economic sustainability, of the production of various goods in the economy. We can attribute to each production firm a certain amount of goods input which is required for the production of the articles which those firms produce. These input goods are associated with monetary costs. Thus, we can attribute a certain production price per unit output for each firm. We can expand this into a graph to represent the variation of this price for different levels of output. If the input goods represented the only factor contributing to the cost of production, then the last case mentioned, in which the prices of all goods decreased by about 9.1%, would be free of complications, for, though the price which the goods sold by firms decreased by 9.1%, and thus, the revenue of firms decreased by 9.1%, the cost of production would also decrease by 9.1%. Thus, the same level of profitability would be maintained. However, the production costs of goods are not determined solely by the cost of input goods requisite to that production. Production costs include the costs of paid labor. Generally, workers wages are not permitted to be reduced. Thus, it seems not to be the case that the profitability of firms would remain the same in the last mentioned case. There is a great variation in the production cost composition of each production firm, some have higher labor costs, and some have higher input-goods costs. Thus, a 9.1% (or any amount in the indicated situation) decrease in the price of all goods would alter the profitability of the production firms in the economy. Some might be forced to shut down if the lowering of the cost of production from general price decreases were lower than the decrease in profitability resulting from decreased revenue (from lower prices) to the extent that the profitability became 0 or negative. For example, if a firm had a 5% profit margin over production costs and production costs were 90% derived from wages paid, a general decrease in goods price of 9.1% would result in a .91% reduction of production costs for the firm, while revenue would decrease by 9.1%. This would leave a revenue to expense ratio of about .96 (which is negative profit). The elimination of firms in the economy on this basis might be a good or bad thing, however. If the firm were producing goods which were not of any potential productive value to the economy, then no loss to society would be incurred. It could be imagined that many firms could resort to large amounts of layoffs with the expectation of rehiring at lower wage costs. However, this option becomes less tenable as society advances. For, as society advances, the general knowledge and skill level required of the average worker in the production of goods increases. Additionally, the skills tend to become more specific and requiring greater amounts of time in training. These trends correspond to the continual increase in the division of labor to be found in societies which are undergoing technological progress and corresponding economic growth.

Government intervention is another option by which this kind of buy-back problem can be resolved. This can be done in two ways. First, the government could tax the money flows involved in purchases of some non-valuable good or service, and then use this money for the

purchase of the extra X (hopefully to some useful purpose). A complication arises: Because the money was taken out of non-valuable economic activity, the elimination of what activity would have no effect upon the EM or the physical productivity of output production. However, if the government takes the funds out of some useful purchasing process in the economy, and thereby reduces the useful consumption of certain valuable goods, then, it will have a deleterious effect on either the EM or the physical goods productivity.

Another option is: a new amount of money can be introduced into the economy (by government) and used for the purchase of the extra X. The complications are as follows: A.) If the same level of X is produced for the subsequent output O3, then no inflation will result if the demand function of the society be altered such that the same amount of X in O2 (twice that in O1) is consumed by the society in the consumption of O3 (this can occur through either government or private spending); or, B.) No inflation will occur if the increased (doubled) level of X be not produced, but all the goods in the economy, including X, be produced in amounts 10% over the amounts in which they were present in O1. This would be to make O3 of the same kind as O1, only differing in size. Thus, generally, for the second case B, we can see that in order to avoid inflation, the percentage rise in total output for O3 must be equivalent to the percentage increase of money introduced to purchase O2.

In the case of OC3, where the extra margin out output, A, is comprised of goods which are of a higher technological level, the absorption of those goods by society is dependent upon the kind of technological advance they represent. If the goods perform a function identical to some goods currently existing in the economy, except better, those superior goods will replace the obsolete ones. No changes in the amount of purchasing money in the system seem to be needed in this case. If the goods are such that they perform functions not previously capable of being performed by any good existing in the economy prior to their introduction, and are not intended to replace other goods made obsolete by such their introduction, we have a similar situation to that of OC2 with respect to buy back. The complications in OC3 are the same as in OC2, but, they are less likely to become problematic since the introduction of a new technology increases total productivity.

VII. Finance and Economic Self-Cannibalization

Finance

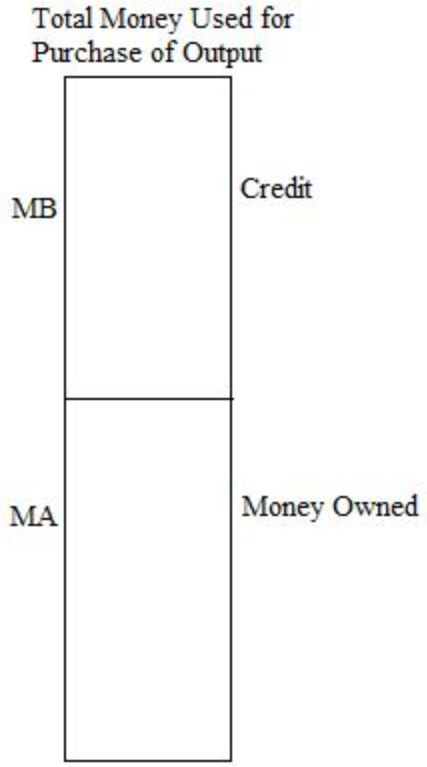
People have developed various arrangements, ranging from simple to highly sophisticated, for exchanging money for the things which they desire. The study of such arrangements constitutes the subject of “finance." We will examine the basic aspects of finance which are most relevant to the object of our report.

Credit

For the most part, all purchases made in a society are done with the use of money which is either owned by the purchaser, or borrowed by the purchaser. Accordingly, the representation of the functional distribution of money to the various population sectors can be further stratified to

represent money spent which is owned, and money spent which is borrowed. Large amounts of purchases in a society are made with money which has been borrowed. Money which has been borrowed is referred to as credit or debt, depending on which party involved in the arrangement is being emphasized.

The money used for the purchase of a given output over the interval of consumption can thus be represented in the following way:



[Figure 30]

The portion of money in the total amount of money used for the purchase of a given economic output which is owned will be referred to as MA. The portion of the total amount of money used for the purchase of a given economic output which is borrowed will be referred to as MB.

Uses of the MB Money Supply

Credit can be utilized for the purchase of goods which enables the members of the society to reproduce the same level of economic output which they consumed over the course of the cycle of consumption. It is also utilized for the purchase of goods which enables the members of the society to produce a greater level of economic output than that which they consumed over the course of the cycle of production. When credit is employed in this way, it is appropriately called "productive credit." When it is employed in ways other than this, such as in speculation, it is appropriately referred to as "non-productive credit."

Titles

Out of the array of financial instruments, perhaps the most common is the *title*. A title is a legal claim to something, such as a good, a service, an amount of money, a portion of the profits made by a certain company, and so on. Many titles are marketable- that is, they can be bought and sold. Stocks, or shares, in publicly traded companies, are examples of marketable titles.

Like all things that are bought and sold, titles have a price. Besides the quantity of similar titles in the market, the price of a marketable title is determined primarily by three factors: the desirability of the thing which is claimed by the title; the judgment of the purchaser respecting the fidelity of the claim the title makes- that is, how likely it is that the claim in the title will be fulfilled; and the judgment of the purchaser respecting the speculative profitability of the title- that is, the price at which the title will be marketable at some future time.

In some situations, it is relatively easy to identify which of these factors has caused a change in the market price for a certain title. For example, if the price of a single share of a company increases while the assets, debt, and profit of that company have remained constant, (and if there is no plan about to be put into effect to change any of those things) then the increase in the price can be attributed to an increase in the speculative demand for the title- an augmentation of the prevailing judgment amongst individuals engaged in title speculation respecting the speculative profitability of that title.

Bubbles

Especially in unregulated markets, a situation known as a “financial bubble” can develop. A bubble is a situation in which the price of a title (or any good or financial instrument) increases solely or primarily on the basis of judgments of speculative profitability. In an attempt to make a speculative profit, large amounts of the specific title available on the market are purchased by members of society. This, in turn, raises the price, which, in turn, feeds the speculative ambitions of profit seekers, and so on. The point at which this process ceases, (or, the point at which “the bubble bursts”) is the point at which the amount of money used for the purchases of the title (which is a reflection of the demand) begins to decrease. Sometimes this can happen gradually, and sometimes it can happen very rapidly as when the lowering of the price of the title on the market induces more holders of the title to sell out of fear of losing profits, which, in turn, lowers the price of the title on the market further, and so on.

In short, increases in the price of titles on the basis of speculation can continue as long as the supply of money allocated to the purchase of the titles on the market continues to increase. As this is not possible, (with a fixed supply of money), bubbles are appropriately likened to pyramid schemes.

Zero-Sum Game

It can be demonstrated that, under conditions of unchanging economic output and money supply, speculation represents a "zero-sum game." It can also be demonstrated that speculation has a negative impact on the economic process- that is, that speculation not only is a zero-sum game, but is generally of negative economic effect on society.

Examples of Zero-Sum Game

A basic example of the idea of "zero-sum game" is the case of the burglar or bank robber. The burglar and bank robber steal valuable goods or money from other people. All the wealth that the burglar or bank robber procure in this way is equal to the amount of wealth that was lost by the persons from whom the money and goods were stolen. Thus, the sum of the amount of wealth gained by the burglar, and the amount of wealth lost by the people who were burgled is 0. Another example of zero-sum game is the act of betting- a simple gamble. Two persons enter into a bet with each other respecting the occurrence of some event, for example. The persons agree to bet $100 that the event will turn out as each one predicts. Someone will win, and someone will lose. Whoever wins has procured money, but only through the loss of an equal amount by the other person. Thus, the sum of the gain and the loss in this game is 0.

We extend our consideration to the simple case of a casino. A casino is supposed to be set up in such a way that the statistical probability of the casino losing money is very low. The games played in the casino, which are supposed to be based on chance, are those which statistically favor the winner to be the casino itself. The only way the casino can procure revenue is by someone losing money on a bet which they made at one of the games on the casino floor. Thus, the casino does not produce anything, or provide any service, which is of any economic value. It is simply a venue where the fantasies of discontented people can be exploited in a fashion statistically guaranteed to succeed. Thus, anyone who would try to claim that a casino is good for the economy is utterly mistaken. Besides the fact that the transfer of money which a casino facilitates is not connected to the consumption of any valuable good or service, the cultural effect on the population is very negative- and the importance of cultural factors in the economic process has been touched upon above.

Some people argue that a casino can be taxed, and, therefore, provides another source of revenue for the government which has jurisdiction over it. This is also mistaken. Every dollar procured by a casino (at least as from gambling operations) is a dollar which *would* have been kept by the person who lost it there. Eventually, that dollar would have been spent by that person somewhere else in the economy. Thus, the total average aggregate revenue of businesses in that economy, which are taxed by the government agencies with jurisdiction over them, would remain exactly the same. The only difference might be the slight increase in total taxable revenue available in the short term after the opening of the casino during which an excited local population moves in to lose their money at the casino more quickly than they would have spent it elsewhere had the casino not existed. The only benefit which a casino can lay claim to is the benefit of a local population. However, as demonstrated, the local increase in the money earned and taxed which might result from the establishment of a casino can only occur at the expense of the revenue of businesses in some other part of the society (and thus, the tax base for another local government). Indeed, this fact is so readily recognized, that it is even referenced in arguments made to local

governments by persons supporting the establishment of casinos. That is, the argument is made explicitly in the following way: “If a casino is not set up here, the casino in the next state over will continue to procure all of the money which could be procured and taxed right here in this state if we had our own!." Unfortunately, it is often not recognized that this fact only proves that casinos play an immoral and decisive role in society, and that, for that reason, among others, they should be eliminated from the society entirely.

Economic Zero-Sum with Financial Speculation

We turn now to speculation in financial instruments such as titles. We examine the process as it takes place within the society as a whole. Accordingly, we represent the population and money supply as we have above. We assume conditions of a constant array of discoveries, constant economic output, constant money supply, and constant real claims of titles and other financial instruments. We imagine that some portion of the money supply is used for the purchase of a certain array of titles over one economic cycle. We thus imagine that the price of this batch of titles is unchanging over time. That done, we see that the only way in which the people in possession of these titles could profit from the sale of the titles would be if another group of people, or some other agency where to purchase those titles at a higher price- that is, if a larger portion of money in the system were allocated to the purchase of the titles than was originally done. Thus, in order for more money to be utilized for the purchase of these titles, the amount of money involved in other exchanges in the economy will need to be reduced.

Reallocation of MA

As an initial example, take the case in which the titles are purchased by another group of people for a higher price. Imagine that the market price of the titles returns to their original value. The group of people that purchased the titles at a higher price would be obliged to sell for a lower price than they paid. Thus, they will have lost some amount of money, say D, in the process. Conversely, the group of people which sold the titles to the other group at a higher price will have made a profit of D. Thus, we have a zero-sum game which is identical in all essential respects to the zero-sum game played at casinos. No valuable goods or services are produced in this process, there is only a reattribution of the ownership of money, and, thus, a reallocation of the output available for consumption.

It might be argued that since the kind of speculation involved in this example is a zero-sum game amongst individuals, there is no loss to the society. To this, a reference can be made to the response made to the identical defense attempted for casinos- namely, that the moral and cultural effect of such zero-sum games on the persons involved in them (whether winners or losers), and on the population as a whole, is highly negative. As demonstrated, moral and cultural factors are as pertinent to the economic functionality of a society as anything else. What kind of misconceived notions of morality and culture might arise and develop in the mind of someone who occupies himself with gaining wealth knowing that it only occurs by the loss of another?

Further, however, we might also reference what was said respecting the investment function of goods input for individuals and their economic productivity. With this considered, it is easy to

see how it is plausible that, on average, the gain in wealth made from speculation will always be consumed to an effect of lesser economic value than the economic effect of the consumption of the same amount of wealth by the person who lost it. This can be easily seen if we assume that the consumption of resources in society is already optimal. While the actual world is very different than this, we might still be able to judge the average effect of random zero-sum game transfers of wealth, as by speculation, as either economically positive or negative. For example, if a society were in a phase of economic growth, it might be judged that the distribution of resources was, on the average, productive, and that, thus, statistically, any random zero-sum game wealth transfers would be, on average, an economic loss. If a society were economically stagnant or entropic, it might be judged that any random zero-sum game wealth transfer would, statistically, actually benefit the economy, if, indeed the economic stagnation was the result of the misallocation of resources.[23]

It will be noticed, however, that we were obliged to use the word "random" in the two cases listed above. But, the zero-sum game transfers of wealth that occur in society are generally not random. Only a portion of society tends to participate in speculation, and, further, there is usually a savvy grouping of market players within that portion which comes to refine various techniques of information collection/processing, and trading operations. The distribution of wins and losses in speculative operations is, thus, usually very lopsided in favor of the experienced operators of that savvy type- initiation into the circles of which usually involves depraved cult-like rituals, as prevalent among certain Wall-Street speculator circles today. I find it probable that (in the vast majority of cases) the moral qualities of those who benefit from zero-sum game processes of wealth redistribution guarantee that the increased consumption of wealth resulting from those processes will be in the non-productive mode.

So far, we have only dealt with speculation from the standpoint of reallocations of parts of the MA money supply. That is, we have examined the economic effect of altering the goods distribution of a society which takes place on the basis of purchases with money which people own. We have not examined the process of speculation from the standpoint of a reallocation of portions of the MB money supply.

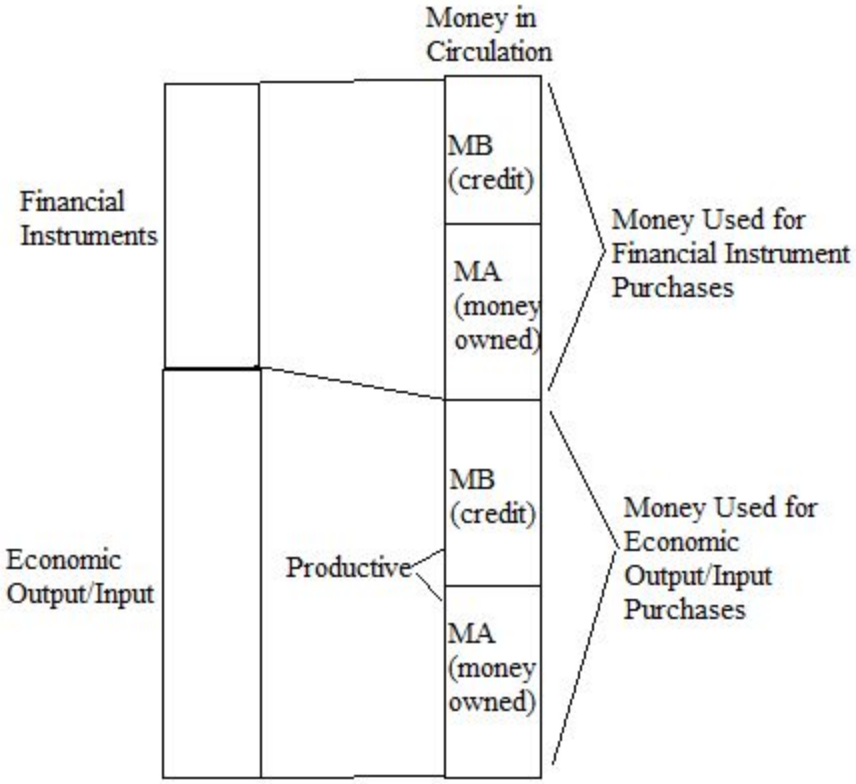
Reallocation of MB for Speculation

Because it is often the case that confident speculators will engage in credit-based leverage in order to maximize profits, a significant portion of borrowed money (credit) in a society will be allocated to the purchase of financial instruments over the course of a cycle of consumption. As above, to assist in pointing out the effects which we wish to discuss, we assume the following

[23]If we imagine a society in which all resources are distributed and consumed in the optimal way possible, any random zero-sum game change in the allocation of resources has a 100% probability of reducing the economic productivity; alternatively, if a society were distributing and utilizing their resources in the worst way possible, any random zero-sum game change in resource distribution would have a 100% chance of increasing economic productivity.Thus, we can conclude that, in between the best and the worst economic behavior of a society, there is a variation in the probability as to whether random zero-sum game changes in resource distribution will be of economic benefit.

conditions: A constant array of discoveries, constant economic output, constant money supply, and constant real claims of titles and other financial instruments.

The situation in which a certain aggregate of financial instruments is traded over the course of a cycle of economic production at a fixed total price and with a fixed amount of MA and MB made for the allocation can be represented thus:



[Figure 31]

Again, because the only way, under the conditions we have described, the holders of the financial instruments could make a speculative profit off of those instruments, would be for other people or institutions in the society to purchase those instruments at a higher price. This higher-price purchase may be made by increasing the amount of MB allocated to the purchase of the titles. If this is done, the portion of MB allocated to purchases of goods in the output for purposes of reproduction of the economic output will be reduced. The effects of this reduction will depend on which population sector of society was deprived of a certain amount of resource allocation in this process. Since MB used for the purchase of economic output is almost always intended for a productive allocation of resources (to ensure that the credit will be paid back by the borrower who put those resources to productive use), a reduction of MB for the purchase of economic output will result in a reduction of productive consumption of that output. Thus, the total economic output subsequently produced will be lower than that consumed over the cycle in which this reallocation of MB took place.

Further, the profit gained by the holders of the financial instruments who were able to sell for a price higher than they paid on the basis of the increase of MB in financial instrument purchases, will now be in the possession of that amount of money by which the MB used for productive purchases was reduced. It might be pointed out that, since the amount of money gained by the speculators was the same as that lost by the total productive MB, the amount of money used for purchases of output will be the same over that cycle of production (assuming the speculators spend their profits). This is true. However, as discussed above, the overwhelming likelihood that the consumption of the speculators would be less economically productive than the intentional investment of resources for the purpose of economic reproduction renders this observation a moot point. The goods consumed by the speculators represents wasted economic potential.[24]

If total economic output is to be maintained under these conditions, the following courses of action could be taken: A new amount of money will need to be introduced into the system to act as the productive MB needed for the purchase and use of the portion of the output which would not otherwise be put to use. This, of course, would be inflationary, since the total money supply allocated to the purchase of the output would be increased; An amount of MA equal to the productive MB reduction could be reallocated as productive MB and put to use in the needed fashion. Depending on where this MA came from, the economic effect would be negative or 0. If this money were to be taxed out of the people who earned the speculative profits in the first place, then the total net economic effect would be 0 (besides the waste of time and resources needed to facilitate such a massive reshuffling of money, a fact which actually serves to prove that, under the indicated conditions, even if profits from speculation were to be taxed at %100, with all of the tax-revenue thereby gained being utilized in precisely the form of investment in which it would have otherwise been utilized, the economic effect of speculative profit would still be negative). If the money were to be taken out of the pockets of the population sectors 1a and/or 1b, this would be a reduction in the resources allocated to those sectors, and, thus, a reduction in the level of output, and the EM of society.

Indeed, specific ways in which a reallocation of money into speculation can take place are manifold: whether it be a reduction of personal consumption by individuals, a reduction in capital investments by businesses, a reduction, by banks of the credit made available for investments in economically valuable activities, and so on.

Economic Self-Cannibalization

But thou, contracted to thine own bright eyes,
Feed'st thy light'st flame with self-substantial fuel,
Making a famine where abundance lies,
Thyself thy foe, to thy sweet self too cruel.

-Shakespeare

[24] Further, the goods which would be purchased by the speculators would be quite different than those purchased for economic reproduction. Thus, such a reallocation will actually be inflationary, as the total amount of money allocated to the purchase of the other goods categories will be increased.

Imagine the following situation: A man who has stable employment and living conditions decides, one day, that he wants to enjoy certain indulgences which he is not capable of affording under his current level of income. In order to make himself capable of purchasing the indulgences he desires, he decides to stop eating. He reasons that, if he were not spending his money on food, then he could afford to purchase those indulgences currently unaffordable to him. He executes his plan, and, being someone not strongly affected by hunger, finds that he is able to enjoy himself to a greater degree than before by using the money previously spent on food to purchase the decadent things he always desired. As we would expect, however, the health of this individual soon begins to falter. The malnutrition he suffers renders him physically weak and more susceptible to disease. Because of this, he is unable to continue performing the work which procured him the income upon which he subsides, and he eventually dies as a result of his poor diet and lack of ability to recover his former health.

Though the hypothetical example given above does, indeed, have correlatives in real life, as attested to by the historical photographs of the skeletal husks of once healthy humans rotting away in the Chinese opium dens, or the horrid hovels inhabited by the drug addict of today, the example serves as a fitting analogy for the process which I will term Economic Self-Cannibalization (ESC).

Some forms of economic waste are very clearly recognized as such. Unjustified warfare, for example, represents a pure waste of the resources of a society for no economic benefit, other than, perhaps, the development of certain production capacities and/or technology developments. Large scale drug use/addiction, as seen in 19th century China and in the USA today, is a very obvious source of waste; in the USA, many potentially productive lives and billions of dollars of resources are wasted every year as a result of this process. ESC, however, is a peculiar kind of economic waste because of the way in which it produces temporary effects which are easily mistaken for indicators of healthy economic behavior.

For example, take the instance referenced in the last section of the report: Reallocation of productive MB into speculation. This creates the effect of an increase in the money owned by certain of those engaged in speculation. Since that money is taken out of investment in economic reproduction, the number of people employed in production will decrease. This decrease in the employment of the population can be offset by the fact that the money gained by the speculators will be spent in the procurement of desirable, although, generally, economically unnecessary services. Thus, generally, the number of people employed in such services will increase, canceling out, to a certain extent, the loss of total employment resulting from disinvestment in production. Thus, the proportion of persons in the total population who are employed can remain somewhat constant even while the productive capacity of the society is being decreased. So, if someone were only considering the effects of speculation on the total employment rate of a society, they might fail to see why speculative profit fueled by reallocations of productive MB are economically undesirable.

The argument might be made "You say that if we no longer invest money in building infrastructure then you, my dear construction worker friend, will be out of a job. But don't worry

pal- for, when my speculator friends and I make profit from the increase in the value of our titles (made possible by the reallocation of the money we would have invested in infrastructure into pumping up the financial markets), we are going to want to go out and spend that money! And you know what that means for you- that's right, all sorts of new employment opportunities!- like preparing our food, washing our dishes, massaging our feet, and cleaning our toilets! You will even probably get paid just as much doing it too- and, remember- unemployment won't increase, and, therefore, the economy will do just as well!" Under such a condition, "demand" for consumer goods will remain constant for the most part, no inflation will be immediately registered, and other economic effects of the disinvestment in infrastructure might not be seen immediately. However, as the infrastructure currently in use begins to wither and decay, its capability to contribute to the total productivity of the society will decrease, and, thus, total productivity will decrease. Once total productivity begins to decrease, various forms of decrease in the living conditions of society will manifest- whether it represents increases in time spent in traffic jams, greater frequency of blackouts, higher utility costs, contaminations of public water supply, reductions in medical care delivery, poorer quality of education, and so on. The rate at which these effects manifest is also increased by population growth, as the per capita share of existing resources is reduced.

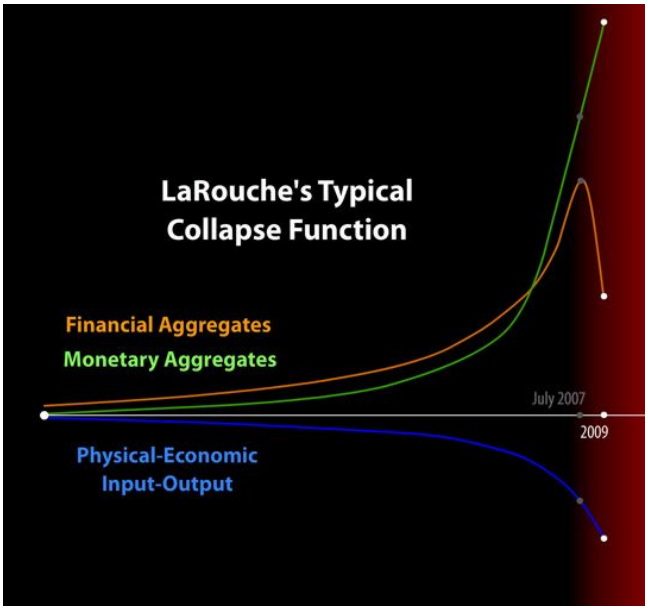
Reductions in total productivity, that is, the increase in the amount of social cost (in labor and materials) required to produce the same amount of output, creates a pressure on production firms to seek out cheaper sources of labor and material; a pressure which is the key factor in driving companies to outsource labor to "cheaper labor markets."

Generally, ESC involves the replacement, by a society, of processes of productive consumption of goods with processes of non-productive consumption of goods.

The Triple Curve

The basis has now been established by which the heuristic device developed by Lyndon LaRouche named "The Triple Curve" can be fully comprehended.

The triple curve is a representation of the relation of three things under a certain mode of economic behavior of society- specifically, a peculiar form of entropic, or deleterious, economic behavior coherent with economic self-cannibalization as described above. The three elements represented in the diagram are 1.) Economic output. 2.) Money Supply 3.) Nominal Values of Financial Aggregates



[Figure 32]

The diagram is explained as follows:

Assume a society with a fixed array of discoveries, and environmental conditions. Assume that economic output and EM is constant over successive cycles of consumption. This assumption combined with the first implies that a certain amount of economic output is allocated to population sectors 1a and 1b. Assume stable amounts and nominal values of financial instruments, as well as stable money supply.

Under such conditions, the nominal value of financial instruments can only be increased by increasing the amount of money which is allocated to the purchase of those instruments in the market. Thus, granted that this addition of money into financial markets takes place, the nominal value of financial aggregates will increase, but, at the same time, the amount of money utilized in other allocations of economic output will need to be decreased. As indicated above, if this reallocation of money is made on the basis of decreased wages or capital expenditures paid for the production of economic output, total economic productivity will decrease, which means that either the economic output will decrease, or a constant economic output will require more labor to be produced- which also represents a cost to society. In short, money is taken out of use for allocating resources productively, and is put to use in allocating resources non-productively. Because the claims made by financial instruments to certain forms of income ultimately trace back to the consumption of real output, the claims of the title are reduced in real terms while the nominal market price is increased. Under normal conditions, this is reflected in the ratio of the market price of a title to the actual income earned by (the holder of) that title over a specific interval of time.

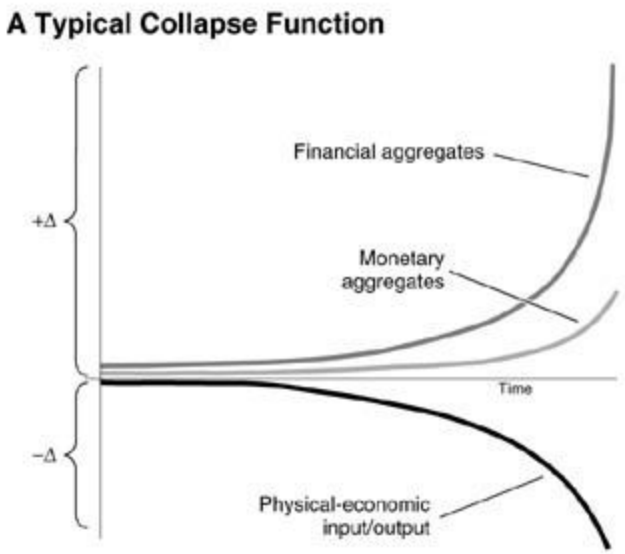
It might be argued that while it is possible that this kind of process can occur in the short term in an economy, the demand for real product will eventually increase in such a way as to offset the flow of money into speculation, as the production of real product will be seen to be the more

profitable employment of money. Further, it might be argued that, on the basis of the growing discrepancy between the actual claims of financial instruments and the nominal market price, increases in prices of financial instruments will eventually become untenable, and the prices will eventually need be reduced to reflect a less inflated, lower price/earnings ratio. The oscillation of money and resources between employment in speculative bubbles and real product production forms the basis for certain cyclical phenomena in economic conditions. While this argument seems to be sound, the following consideration must be made: As discussed above, the money supply of a modern economy can be changed on demand. Thus, the possible market self-correction of undue quantities of money flowing into speculation at the cost of real economic production under conditions of constant money supply may not occur in situations where the money supply is constantly increasing.

We consider the above situation with the additional factor of increasing money supply: The decrease in credit made available to the production of real economic output as a result of reallocation of productive MB into speculation might be offset by the introduction of a new amount of money into the system of an equal amount, which is attempted to be put to use in the way required to sustain a constant level of economic output. However, this would not allow the same amount of output to be invested into production as before, unless the total amount of money introduced into the system for productive use was enough to enable the proportion of money allocated for non-productive use to money allocated for productive use to equal the ratio prevailing before the reallocation of money into speculation. This would be, functionally, to inflate the currency in such a way as to attain the same proportions of goods distribution as before. This would be a very impractical and probably impossible thing to do. Thus, even if some amount of money is introduced into the system to compensate for the reduction of RC, the total allocation available to production will decrease (if the practically impossible step just described is not taken). In short, the bite will need to be taken out of someone's hide. Since that bite is being taken out of the hide of productive activity, the total output will decrease, and inflation will result.

It should be pointed out that the increase of the amount of money put to use as credit in this way can occur as either 1.) an introduction of a new amount of money into the system. 2.) an increase of the credit multiplied out of the current monetary base, as by a decrease in the required reserve ratio of banks. As the introduction of new currency into the economy generally is in the form of a loan, both courses of action imply an increase in the total debt in the system.

If the process of monetary expansion coupled with increasing amounts of credit funneled into speculation is allowed to continue over successive cycles of consumption, the effect will be perfectly represented by the triple curve, particularly the original version. The original triple curve diagram, which shows a constantly increasing money supply and nominal value of financial aggregates along with constantly decreasing economic output is below:



[Figure 33]

The newer version of the triple curve represents the same thing, but with the added representation of the point at which the nominal value of financial instruments is no longer sustainable under by means of monetary reallocations which had made previous increases of nominal values possible. After this point, the nominal value of financial aggregates begins to fall. This can only be offset by an acceleration of the increase of money allocated to the purchase of financial instruments of the market. There may be a number of instances in which this occurs before a critical collapse of the economic system as a whole. Despite such variations over time, the general trend of a system operating in such a way is well represented by the original triple curve diagram; that is, there is no conceptual contradiction or discrepancy between the latter and earlier versions of the triple curve diagram.

Case Study: The US Economy

The economic behavior of the United States over the past half-century conforms to the kind of economic self cannibalization represented by the triple curve. Generally, greater and greater portions of the supply of money and credit in the US economy have been allocated to speculative investments in financial markets. This has occurred in various ways.

With respect to the increase of the amount of money and credit involved in speculation, here are a few examples: The total portion of the US population engaged in stock market speculation rose from about 5.5% in 1950 to about 66% in 2007. Today, it is about 55%. Various Wall-Street supported legislative measures were taken over that same interval of time to create exceptions to the Glass-Steagall Act, which prohibited the use of money held at banks to be utilized for speculation. Each exception that was made to the Glass-Steagall Act represented a new source of money which could be put to use in financial speculation- a new source of money to increase nominal financial values (while being taken out of investment into economic reproduction and/or expansion). The Glass-Steagall act was fully repealed in 1999, opening up the massive pools of

bank deposits for use in speculative operations in financial markets. It is likely that the investment profile of US pension funds has also become largely speculation based.

In conjunction with this massive increase of the portion of US credit and money tied up in financial speculation, greater amounts of money have been put into the economy by the Federal Reserve. The "monetary base" of the US economy has increased from about $53 billion in 1967 to about $872 billion in 2008, an average of a 7% increase per year. Today, the monetary base stands at about $3930 billion, representing an average yearly increase of about 16.5% from 2008. (Although the rate was much greater between 2008 and 2014 during the quantitative easing programs.) The money injections into the financial system over the 2008 through 2014 interval were done, as explicitly stated by the Federal Reserve, to maintain the values of securities in the financial markets, as opposed to increasing the production of real economic output.

Consistent with what we have discussed above, these changes in the monetary behavior of the US have resulted in a lowering of valuable goods production in the US economy, as indicated by major reductions in manufacturing output, and the decay and non-replacement of basic economic infrastructure over the past 50 years. For, reasons indicated above, the employment rate has remained somewhat steady over this time period, as productive employment was regularly replaced by increases in non-productive, or marginally productive, service employment. Goods consumption on the part of the US population has not collapsed in proportion to the collapse of goods production because of the use of debt to finance large amounts of imports. Accordingly, the US balance of trade has been negative almost every year since 1976. In 2016, the US trade deficit was about $502 billion, nearly as large as the entire GDP of Sweden, the 23rd largest economy in the world. In other words, in 2016, the US extracted an amount of valuable goods and services from the world economy nearly equivalent to the total value created by the entire country of Sweden that year. That is, an amount of labor nearly equivalent to that of every single employed person in the nation of Sweden for an entire year was expended to provide the US with economic input for which the US returned nothing in exchange. As was mentioned, this has been the case year, after year, since 1976.

Consistent with what the above identified necessity of an increase in total debt in the system under such conditions, total US debt has undergone a great increase over the interval indicated. Because total debt increase should be considered in conjunction with the growth of the total economy, we examine the total debt to GDP ratio for the years 1975 and 2017. The ratio of total debt to GDP for the year 1975 was 1.59, while the ratio was about 3.5 for 2017.[25] Thus, the total amount of debt needed to facilitate the exchange of goods and services in 2017 was more than twice as much than was required in 1975; specifically, about 2.2 times as much, or 120%, larger.

Further, as mentioned above, the monetary profits from speculation are generally not distributed over the entire society, but, rather allocated to a small portion of the population (such is usually

[25] The Federal Reserve stopped collecting data for total debt in the US economy at the end of 2015. The figure I used to estimate total debt for Q4 of 2017 was based on the yearly rate of growth of total debt from 2014 to 2015. Based on this rate, the total debt in the US economy will total about 70 trillion by the end of 2018.

the nature of zero-sum game)- and generally the portion which is already the wealthiest. Consistent with this, the "wealth gap" in the US economy has become disturbingly wide.

Mitigating Factors

Unlike the hypothetical examples used in the foregoing section to illustrate certain of the processes of economic self-cannibalization, technological progress has occurred over the past decades in the US. Granted, this technological progress is not at the rate that it could have been, or in the areas of potentially greatest benefit, but what has been accomplished has enabled efficiencies to be squeezed out of certain processes in the economy, thereby mitigating the negative effects of what is otherwise systemic economic self-cannibalization. At this point, however, the advances in technology no longer afford the benefits to US society which prevent regressions of the EM, as seen in US life expectancies, which have decreased, now, for the second year in a row, and will likely continue to decrease unless serious action is taken to eliminate the cultural and economic causes of the despair which brings about "deaths of despair."

Increased debt-financed imports and technological progress may have allowed the per capita consumption of certain kinds of goods and services to remain constant, or even increase, amidst the more general trend of economic decay, even with a growing population. But, this is mainly the case for consumer goods, as opposed to capital goods, the consumption (use) of which has been greatly reduced on account of the fact that there is a greatly reduced amount of goods production occurring in the US. Inflation over this interval has been high, but disproportionate amongst different kinds of goods and services. Healthcare, housing, transportation, education have, generally, increased much more than the price of more basic consumer goods.

Additionally, the US has been in a privileged economic position for the past decades. Specifically, US dollars are widely accepted as money by large portions of the global population. Thus, unlike most other countries, which need to rely upon the amounts of desirable goods and services which they produce to ensure that their national currencies will be capable of purchasing goods on the world market, the US dollar is widely accepted as form of payment by *convention*, meaning that the US does not necessarily need to produce desirable goods or services in order to ensure that US national currency will be able to purchase goods on the world market. For example, if a small, impoverished country attempts to use its national currency to purchase certain goods from sellers in another country, that country might not be able to do so because the sellers might find that the impoverished country does not produce anything which they find desirable, and, thus, the sellers would have no reason to accept the currency of the country as payment. On the other hand, if the national currency of that impoverished country so happened to be conventionally widely accepted by many other people, selling many different kinds of goods, in many different countries, then the sellers would have a very good reason to accept the payment, for then the sellers could use the money obtained by the sale to purchase any kind of a wide variety of international goods. Thus, the impoverished country would benefit from the fact that it's currency was widely accepted; it would have the ability to receive more value than it could itself reciprocate in trade. Such a country could even use this advantage to create money solely for the purpose of import financing, knowing that, since its national currency was so commonly and widely used internationally, the money would not likely make its way back into

the domestic economy and cause undesirable inflationary effects. Thus, just as such a hypothetical country would benefit, so has the US benefited from the conventional widespread use of its currency around the world: The US can rely upon the ability of the dollar to finance imports to a greater degree than the dollar normally could, that is, if the dollar were not conventionally accepted payment on such a wide international basis.

Further, the US has seized certain economic benefits through exploitative practices of internationally active US companies, and of the US government itself. We will not take the time to detail such practices here, only referring the reader to certain books on the topic, such as *Confessions of an Economic Hit Man* by John Perkins.

These factors, while mitigating against certain of the deleterious effects of economic self-cannibalization, have actually served to exaggerate the manifestation by US society of the features typical to all late-stage empires: disproportionately bloated to decadence in certain superficial parts, while generally suffering from systemic, mortal, internal decay.

VIII. Political Economy

Ideally, all activity, all consumption of goods, in a society would be productive. This would correspond to the optimal use of money and credit throughout a society which allocates resources through monetary transactions. Some people abide by the actually religious doctrine of the "invisible hand", which maintains that the aggregate effect, in a society, of each individual's attempt to maximize the satisfaction of their animalistic urges, will be the allocation of the resources of society closest to the optimal which is possible. We know, however, that the allocation of money and credit in a real society which uses money to allocate resources never corresponds to the optimal possible allocation. The role of national government is to take actions, within the limits of propriety, to ensure that the resources of society are being put to the most productive use possible.

Besides placing restrictions on financial institutions in order to ensure that the monetary capabilities of those agencies are not wastefully put to use in non-productive allocations of resources, the national government can also engage in "dirigistic" initiatives. These include the use of taxation, borrowing to allocate resources to the production of infrastructure, funding of scientific and technological research, education, and initiatives which challenge the capabilities of society as exemplified by John F. Kennedy's initiative to put men on the moon and return them safely to earth. Besides these measures, the government can establish corporations, such as the TVA, which facilitate the productive use of the resources of the nation. This includes the establishment of banks.

The establishment of a bank by a national government provides greater surety than would be found in a society without such a bank that the credit-based allocations of the resources of society will be put to use in ways which are in the interest of the society as a whole. Capitalization of such institutions can, naturally, take place in the same manner as that of any other such institution.

As the government is the authority (in a truly sovereign country) over the supply of the national currency, the government can, in addition to the measures mentioned above, use its power to create money as a means of allocating resources. This course of action has been utilized many times before in history, often with negative economic effects, such as hyperinflation. We will examine the basis for determining the proper use of this expedient.

Increasing Money Supply: Credit vs. Money

Imagine that an amount of money is created by a national government and introduced into the economy in the form of the purchase of a certain amount of goods. There are two ways in which this can happen: 1.) As spending of money. 2.) As investment of credit. In the first case, the newly created money is not contracted to any obligation to be re-procured by the government. It is merely created and spent. In the second case, the newly created money is spent by the government, but under the obligation that the government will procure that same amount of money in the future with which to pay itself back. Why would the government want to pay itself back in this way? Since it created the money in the first place, why would it feel obligated to find a way to take that much money back out o the economy to pay itself back and extinguish the money it had formerly created?

The reason is that it is the responsibility of the government to ensure that all of the actions which it takes to the effect of allocating the resources of society to be consumed in a certain way are done such that that consumption of resources produces a beneficial effect to society as a whole. In accordance with what we have discussed above, this means that the effect of government initiatives must be to increase the EM of society, and/or the economic output the consumption of which is the basis for the sustenance of the EM of society. Thus, any allocation of goods which the government makes for the purpose of creating valuable goods, such as infrastructure, ought to result in the production of goods which are of at least equal or greater value than the goods which were consumed as a result of that allocation of money. Thus, in a society in which the allocation of goods is facilitated by money, any goods-producing investment of resources which the government makes ought to result in the production of something which is of equal or greater price (assuming that prices reflect the actual value relations of the goods). Thus, the distribution of the good so produced by the government should be associated with a potential for revenue which is at least equal to the cost of production.

This revenue can be of two forms: 1.) Direct; and, 2.) Indirect. The case of direct revenue is easily exemplified: The federal government invests money and the resources of society into the production of a power plant or some other public utility. This power plant produces electricity which is marketable. The total revenue procured from the sale of electricity by the powerplant is at least equal to the cost of production and operating costs of the plant over the interval of the operation of that plant. The government thus procures at least as much money as it spent in the production of the powerplant. The government has ensured that the expenditure which it made was productive, or, valuable, as opposed to unproductive, or non-valuable.

The kind of indirect returns which a government can procure are exemplified as follows. The government spends a certain amount of money constructing a large highway system to increase

the efficiency of automobile transportation in the society. As opposed to putting toll booths on the highway, the government simply adds a tax in an amount appropriate to the generation of revenue suitable to an investment of such an amount. In this kind of return, the government does not need to set up a payment system by which the use of the produced good by the society is directly charged. Rather, it can be assumed that the good is valuable enough that the members of that society *would* use it, even if that use were at a cost, to increase profits. Thus, it can be assumed that the use of the good by the society represents an increase in the profit of the economy as a whole. In this situation the government can do one of two things 1.) Rely on current tax rates on profits to pay itself back; or, 2.) Increase taxes on profit margins to pay itself back. The fist course of action is acceptable if the current tax rate on profits applies to a portion of the increased margin of profit to the extent that the amount of added tax revenue is enough to meet the appropriate repayment schedule. The second course of action should probably be taken if the condition for the first is not met.

There are also differences with respect to the way in which financing occurs. If a project is financed by spending taxed revenue, then no repayment schemes are necessary, since the public already paid for the project. If the government borrows money to finance the project, then a repayment will need to be made to the creditors of the government; thus, the government will need to raise more revenue unless it is to cut spending elsewhere- and the raising of revenue can be accomplished in one of the two ways just mentioned.

Thus, by operating on the principle that all new forms of currency which are introduced into the economy will be in the form of credit which eventually needs to be paid back, the government places upon itself a constraining standard of propriety in taking a measure which has otherwise so frequently resulted in severe economic damage so many times in history. This constraint is, of course, the basic idea underlying the distribution of loans by banks (which is also an action which increases the money supply of society); it is really nothing other than the constraint of economic rationality.

When are Increases of the National Currency Supply (as Credit) Necessary?

There is only one condition which justifies the introduction of a new amount of money into an economy: namely, that in which the current amount of money and credit in the system is not enough to facilitate the distribution of resources of the society in the most productive way attainable.

This implies that, before resorting to introducing new credit into the economy, a national government should ensure that the way in which it currently spends its tax revenue and received loans is already as close to being fully productive as possible. Otherwise, the introduction of new money will be more likely to result in unnecessary inflation. That is, even if the allocation of resources facilitated by the spending of newly created money by a national government results in an economic profit to the society, the result could still be inflationary, especially in the interval before the completion of the productive investment, due to the total increase in money supply; whereas, such an inflationary result might be avoided if the government simply reallocated its current expenditures in non productive activity to the same productive investment. We might

call this unnecessary inflation an “opportunity cost of the inflationary variety", since, after all, if the government had reallocated current spending in the way described, no inflation would result, while, alternatively, at the cost of the same inflationary effect, another productive investment could have been made. That is, at the cost of the same amount of inflation, the government could have increased economic profit more with a reallocation of otherwise wasteful spending than if it had not made such reallocation.

Besides this condition, it seems that we must acknowledge the propriety of another step to be taken by a national government before introducing new currency into its economic system: namely, to take measures, within the limits of propriety, which minimize the allocation of money and resources into wasteful consumption by the society generally. That is, the government should not only reduce its own non-productive use of resources, but it should also take measures to reduce the non-productive consumption of resources by other parts of society. This includes, for example, curbing speculation and eliminating flows of money into elicit activities to the greatest extent possible.

Assuming, then, that the spending of a national government is, for the most part, productive, and that all measures within the limits of propriety have been taken to eliminate waste consumption of resources in the other parts of society, how are we to determine whether or not the amount of money in circulation is enough to facilitate the productive allocation of the resources of society?

We might provide an approximate answer as follows: If the above conditions are satisfied, then the goods producing capacity will serve as an indicator as to how much new money/credit should be introduced into the economic system. That is, if it is found that there exist certain productive capacities which, if actualized and invested in the proper way, could result in an increase in the productivity of the system, then a new amount of money can be introduced into the system for the purpose of actualizing those capacities for increasing economic productivity. The potential for inflation resulting from this measure must be considered in the following way: If the new investment of the actualized capacity leads to a productivity increase great enough to nullify the inflationary effect, then long term real inflation will not occur; short term inflation may occur however.

It may be found that, as a result of something like the bursting of a large speculative bubble, the amount of credit in the economy becomes insufficient to maintain the reproduction of even constant levels of goods output. Such a case would be an extreme instance of underutilization of productive capacity. Introductions of new money into an economy in such a state may have no inflationary effect as they would be made for the purpose of reestablishing previously existing ratios of purchases of goods to total goods production.

A Balancing Act

With what has been said in the previous section, we are confronted with a question respecting the introduction of new amounts of money into an economic system given the existing money creation capacity by banks.

Banks are capable of increasing the money supply by issuing loans. However, the amount of credit which a bank can issue is regulated by the government in the form of the reserve requirement. The reserve requirement thus affects the money supply. The question then arises: To what extent should increases in the money supply be effected through reductions of the reserve requirement of banks, as opposed to the introduction of new quantities of money by the government? We have concluded that the only appropriate context in which the increase of the money/credit supply should occur is one in which the money/credit in circulation is insufficient to allocate the resources of society in the most productive way. Thus, if a shortage of money/credit is found to exist, the government can either reduce reserve requirements, or introduce new money into the economy itself in the form of credit. Which course of action should be taken?

In a money shortage situation in which bank reserve requirements were already at minimal levels, the only way to increase the supply would be by government directly creating new money. But what about in situations in which the reserve requirement of banks was high enough such that lowering the reserve requirement would not appreciably increase the risk to the banking system? The answer to this question depends upon a consideration of the differences in economic roles played by government and private industry.

Generally, the role of the government is to perform those actions which are of widest systemic benefit to the society as a whole, especially those actions which are either unlikely or impossible to be performed by any other agency, individual, or group in the society. This implicitly defines the economic role of government. Accordingly, the role of government in the production of economic output is that role in which it is uniquely capable of performing, and which is of most systemic import for the society as a whole. This corresponds to things such as the production of large scale infrastructure projects. Such projects are the responsibility of government. For similar reasons, it is undesirable for the government to involve itself in the production of those parts of economic output which are of less systemic relevance, and/or, which is easily performed by private entities just as well or better. Thus, it would be undesirable for a national government to involve itself in the production of cars or teacups for example.

These considerations are relevant to our attempts to address the question respecting how the money supply is to be increased. Let us look at the possibility in the extremes to get a sense of the range of potential options. 1.) The government takes no actions directly to increase the money supply, but, rather, simply lowers the reserve requirements of banks to the minimum level. 2.) The government increases the reserve requirement of banks to the maximum level, say 100%, and proceeds to, in effect, take sole responsibility for credit issuance, while increasing the money supply by means of new currency introductions alone.

What are the economic characteristics associated with these two extreme options? In the first instance, a great risk would be created in the banking system, while a minimization of government directed investment into systemically vital production would occur. This would be undesirable. In the second instance, nearly all private enterprise would grind to a halt, and the government would be put into a position where, in order to sustain the economic reproduction of the society, it would be required to engage in the distribution of credit into all the channels of

production that would have otherwise occurred through private initiative- an impossible task. On the other hand, if, in this second situation, the government only engaged in the production of those parts of economic output -such as infrastructure- which were appropriate to it, there would be no elaboration of the potential benefits of the production of that infrastructure in the society, due to the lack of credit available for the production of the rest of the goods upon which the welfare of society depends- even though he systemic physical basis existed for that production. That is, the synthetic environment of a society only committing itself to building the infrastructure, and other systemically vital components of the economic output, would not be "fleshed out" in the fashion most beneficial to human existence. Infrastructure and similar aspects of the synthetic environment are only valuable if they are used to provide the basis for the production and consumption of those things which more directly improve the human condition.

Thus, there must be a balance, or harmony, of sorts, in which the government produces the amount of infrastructure which is optimal to the production of the other aspects of the synthetic environment upon which the welfare of human beings more directly depends, while private industry "fleshes out" the synthetic environment in the way most favorable to the perpetuation of human existence in the universe. This consideration should inform the decisions respecting how the money/credit supply of a society in need of more credit is to be increased.

Another Consideration

Respecting the question of increasing money supply, and related to the consideration of the proper balance between allocations of credit and resources into government initiated infrastructure projects and other goods production through private enterprise, is the issue of productive capacities. A certain indication respecting which kind of money supply increase should take place might be given by the profile of latent productive capacities in the economy. If there is an unused capacity in many industries which, when taken together, represent infrastructure building potential, then it would be useful to consider increasing the money supply in the form of financing government infrastructure production. Unused capacities in more basic goods producing sectors should be left to be productively actualized by private initiative. A shortage of credit for such investment might be made either by reducing reserve requirements, or by increasing credit supply to banks indirectly by increasing total money supply in the first way described.

Generally, all direct increases of the money supply by government should be made in the form of a debt taken on by the government for the purpose of gaining access to the resources which enable it to produce something of systemic value to society, preferably something which increases total economic productivity.

Taxes

With what has been said above, the basis is laid to address, in as concise a way as possible, the essential theoretical basis for the practice of *taxation* by governments.

We all remember when, as children, we first asked the following question: "Why does the government need to take our money (tax us) when it can create more money whenever it wants to?"

The answer which we all received at that time, while probably not informed to the extent that the current reader is now informed respecting basic economic theory, was nonetheless correct: that would cause inflation. Indeed, increasing the total amount of money involved in the purchase of a certain amount of goods cannot but correspond to an increasing price- save for the situation in which the rate of growth of the supply of the goods purchased is greater or equal to the increase of the money involved in purchasing them.

Taxation reduces the amount of total economic output which can be consumed by those taxed. Thus, a tax only allocates the goods consumption capability from one part of society to another (the government). Taxation allocates the portion of output which the taxed *would have* consumed, to the government. There is no increase in money supply, and no inflationary effects. [26]

Government Borrowing

The same logic which applies to the theoretical basis of taxation applies to the practice of government borrowing.

When a government borrows money from those who are currently in possession of it in the society, the government is providing itself with the capability to consume the amount of resources which the original possessors of that money (the creditors) could have either themselves consumed, or, by lending that sum elsewhere, enabled someone else to consume.

Thus, the practice of governmental borrowing is not, in itself, associated with inflationary effects.

Directing Credit

As mentioned above, the general economic objective of a national government is to ensure that the resources of the society under the jurisdiction of it are allocated in the most beneficial way to that society as a whole. This corresponds to the task of ensuring that the money and credit of the society are utilized to allocate resources in the most productive way possible. There are a number

[26] To briefly mention a complication: It can be pointed out that the rate of consumption of output by a government which has procured X amount of tax revenue may be higher or lower than the rate of consumption of economic output which would have occurred had X not been taxed (but had, instead, remained in the possession of the original owners of it). It is likely true that, generally, the rate of consumption of output by the government is higher than the rate of consumption of the taxed would have been in instances in which the taxed were more wealthy; while, conversely, the rate of consumption of output by the government is lower than the rate of the consumption of the taxed in instances in which the taxed were more impoverished. This is likely because the wealthy spend a portion of their total wealth slower than the poor spend a portion of their total wealth.

of ways in which this can be accomplished. Besides taking measures which discourage the flow of credit into speculation (and economic output into speculators), measures which serve to more directly augment the productive use of credit and resources can be taken.

Incentives for Directing Private Credit

The use of investment tax credits is known. In addition to such credits, the government can encourage the allocation of credit and resources into processes of productive consumption by altering the tax rate on revenues earned by banks through investments in such categories of activity.

For example, if the government wished to encourage the flow of credit and resources into the production of infrastructure, the government could establish a tax-cut on revenues procured by banks through loans made to municipal and/or state governments which were taken out for the purpose of infrastructure construction. This would make such loans more profitable to banks, even while serving to lower the rate of interest offered by banks to such governmental agencies, thus doubly encouraging investments in infrastructure corresponding to the standards set as part of the program.

State-Run Banks

The establishment of a bank which is operated by a national government provides a useful tool for ensuring that the credit of the economy which is under the jurisdiction of that government is used in the way judged by that government to be most productive to the society as a whole.

It might be argued that the establishment of a government operated bank would provide no additional benefit to the government or the society. For, a government can simply borrow the money from private lenders, and invest that money in the same way it would have invested it had the government been operating a bank. In response, it can be pointed out that, in such a case, there would be an additional overhead expense in putting the credit to use in the desired way, on account of the interest on the loan which the government would be obliged to pay to the private lender. However, operating a bank is also associated with costs, such as operating costs, as well as interest paid to depositors. Thus, the cost of operating the bank would need to be less than the interest cost which the government would incur by simply borrowing in the normal way. It is likely that the costs associated with operating such a bank would be lower than the costs associated with traditional borrowing but not guaranteed. While it may be the case, at a certain point in time, that the rate of interest on government debt is low enough to make the cost between the two options comparable, the costs of running a bank are not susceptible to the kinds of fluctuations in the way is the market rate of interest on government debt. Thus, a bank might provide greater surety of minimal costs to the government to exert the sovereign right it has to direct the credit and resources of the society. Further, even is market rates of interest on government debt become so low that traditional borrowing becomes less expensive than operating a government bank, the government can simply resort, at those instances, to traditional borrowing as its primary instrument of economic investment.

One more consideration pertinent to this issue is the following: The role of government in economic activity seems to have gradually increased along with the advancement of the human species. This is likely because the tasks which mankind has taken up over the course of history have become larger and larger in scope as the power of mankind over the universe has increased. Thus, the economic role of governments, which have the authority to command the resources of a society as a whole and to accomplish those task are otherwise incapable of completion by any other agency in a society, would not surprisingly increase as mankind develops. The proper economic role of government in the 21st century was illustrated, even if as by a glimmer, by the Apollo mission launched by John F. Kennedy. Only by considering the actually necessary imperative of the expansion of humanity into the vast frontier of space over the next hundred years, as by the colonization of the moon and Mars initially, can the proper economic role of government be truly appreciated.

Given the seemingly necessary and inevitable increase of the role of the government in the economic process over the next hundred years, it may do well to establish those institutions which provide the government with the widest range of tools for exerting its proper influence over the credit and resources of society.

Methods of Cost Reduction in Government Credit Operations

Whether a sovereign government chooses to engage in credit based directions of national resources through the instrumentality of a government-run bank, or through the traditional method of borrowing, that sovereign government has the capability to reduce the costs of procuring credit.

Examples of Methods of Reducing the Cost of Obtaining Credit with a Government Bank

Generally, the government can use its power to impose regulations and other measures which ensure that the bank it establishes will not suffer a shortage of deposits.

For example, the government can set a very low upper limit on the rate of interest which all banks in the economy, other than its own, can offer to depositors. This would give the government run bank a sort of monopoly on the “deposit market", ensuring that it receives the deposits which it required to perform the lending which it wished to perform. The cap of the rate of interest on deposits by the rest of the banks in the economy could be adjusted under changing economic conditions. Certain kinds of exceptions could be made to the interest rate cap to ensure that no negative effects occur. For example, community banks and/or smaller banks could be allowed to offer a higher interest rate to ensure that they would not lose all depositors. Banks operating in certain communities identified as areas of credit shortage could be granted similar exceptions. And so on.

For obvious reasons, measures to severely discourage flows of money and credit into speculation will also serve to increase the amount of deposits which such a bank would receive.

Examples of Methods of Reducing the Cost of Obtaining Credit through Direct Borrowing

As in the case in which a government establishes a bank, any successful effort on the part of the government to stifle the flow of credit into speculation will serve to reduce the rate of interest on government debt, as less options other than government securities would present themselves to investors. Reinstating Glass-Steagall in the US today, for example, would destroy most of the speculative markets, and contribute to keeping the interest on federal debt reduced.

The money creating power of the government can be put to use in ways other than simply providing the government with more spendable cash. Money can be created for the purpose of regulating the interest rates on government debt. In the 1940's, in the US, the Federal Reserve operated, under orders from the government, to fix the interest rate on government debt by buying and selling government treasury bonds on the market. These purchases were made with currency created by the Fed itself. Thus, the money supply increased, and inflation resulted.The logic behind this practice was that the amount of money which the Fed was to introduce into the economy in this way was less than would be introduced into the economy if the Fed had simply created all the money which the federal government needed to borrow at that time, and lent it to the federal government directly. That is, 1.)The Fed could have created the money which the government needed to borrow and lent it to the government at low interest; or, 2.) The government could borrow the same amount of money, at the same low interest, from the public itself, by ordering the Fed to create just enough money to keep the rate of interest low. Thus, the amount of money introduced by the Fed into the economy, and thus the amount of inflation, in the first option would be greater than in the second option.

Granted, the measure just described was adopted as a wartime measure, but it did continue past the war, and there seems to be no reason that the same measure could not be adopted again today. To do this would, of course, mean that the government would have to exert more control over the practices of the Fed, which has grown accustomed to operating without the concerns of the government in mind.

IX. The Four Laws

With what has been discussed above, the theoretical rationale behind the four laws proposed by Lyndon LaRouche can now be more readily indicated.

Glass-Steagall

By reinstating the Glass-Steagall Act "*without modification, as to principle of action"* the amount of money and credit put to use in speculation will be drastically reduced. Thus, the negative effects of increasing the allocation of money and credit into speculation discussed above will be drastically reduced. Without access to the massive pools of US bank deposits, Wall-Street will no longer be able to sustain profits from speculative operations for quite some time.

Reinstating the Glass-Steagall Act will be beneficial, but, there are other measures that can be taken which are consistent with the principle behind the specific restrictions of the Glass-Steagall Act which will have similarly beneficial economic effects. I have elaborated some of these measures in another report.[27][28]

"A Return to a System of Top-Down, and Thoroughly Defined, National Banking"

As discussed earlier, the objective of government is to ensure that the resources of society are distributed in the most productive way possible. This corresponds to a need to influence the flow of credit and money in the society.

For quite some time, the US government has not effectively pursued this objective, if it can be said to have pursued it at all. Whether it be by the establishment of a government-run bank which will collect the credit needed to facilitate necessary government investments in such things as infrastructure and the like, or wether the government create an arrangement where private banks currently in operation can perform the lending corresponding to such economic objectives, the government will be engaged in a "top-down" effort to facilitate the use of the economic output of the nation in the way required of any government pursuing the interests of the society over which it has jurisdiction.

It should also be pointed out that, upon the reinstatement of Glass-Steagall, many of the speculative bubbles in the economy will burst. This will correspond to a major contraction of credit. The contraction will likely be of such a magnitude that production of economic output at current levels will not be capable of being facilitated by the credit which will then be available. Thus, the supply of credit will need to be increased. Under such a condition, the government will have the opportunity to increase the credit supply in the ways which are of greatest beneficial effect to the economy.

"The Purpose of the Use of a Federal Credit-System, is to Generate High-Productivity Trends in Improvements of Employment, with the Accompanying Intention, to Increase the Physical-Economic Productivity, and the Standard of Living of the Persons and Households of the United States."

The term "Physical-Economic Productivity" used in this statement refers to the ratio of total social cost, as in labor and resources, to the amount of a certain kind of produced economic output. Obviously, increasing the productivity of production of economic output by society of would be to increase the profit to society as a whole (or to reduce the economic deficit which a society might be operating under). Only by increasing output can the human hardships resulting from a dearth of valuable goods be addressed.

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[27] "Reconceptualizing (and Extending) Glass-Steagall as a Principle" https://www.findingprometheus.com/single-post/2017/06/02/Glass-Steagall-is-a-Principle

[28] I have also elaborated someof the potentially serious effets resulting from reinstating Glass-Steagall in another report "Glass-Steagall: Economic Effects and Policy Response Options" https://www.findingprometheus.com/single-post/2017/06/02/Glass-Steagall-Economic-Effects-and-Policy-Response-Options-Thereof

While LaRouche does not employ the EM as we have in this report, increasing "the standard of living of the persons and households of the United States" generally corresponds to the idea of increasing the EM of society, which, as we have discussed, is a paramount goal of economic science and practice.

"Adopt a Fusion-Driver 'Crash Program.'"

As discussed above, the PEM of a society is limited by the array of discoveries which that society has assimilated. Therefore, efforts should be taken to make those discoveries which have the greatest impact on the PEM of a society. The kinds of discoveries which tend to be the most augmentative of the PEM are those which most directly impact the productivity of economic output production. Thus, a society should pursue those kinds of discoveries which will have the greatest impact on the productivity of production of economic output. Today, the most promising of such discoveries to be made is controlled thermonuclear fusion. Mastery of controlled thermonuclear fusion will enable mankind to do things which are actually beyond the imagination of most of the persons living today. Needless to say, shortages of material goods, pollution, and many other problems which so many abject-minded persons have cynically taken to be permanent aspects of the human condition, will become things of the past, looked back upon by a more developed, yet cringing, human species.