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The Science of Physical Economy as The Platonic Epistemological Basis for All Branches of Human Knowledge

by Lyndon LaRouche

American statesman and physical economist Lyndon LaRouche wrote this document in 1994 after he was freed from prison on Jan. 26, 1994. He was a political prisoner for five years.

Beginning not long after 1989's economy-driven collapse of the Warsaw Pact system, gradually, those establishment thinkers who were no longer blinded by the hysterical mass-propaganda of the London- and Wall Street-centered monetarist financier factions have appeared to register publicly a fresh overview of what happened to the Soviet system at the close of the 1980s. Not only had the Warsaw Pact system disintegrated, but the collapse of the post-Yalta form of Anglo-Saxon financial and, probably, the political system, too, was not far behind. That succession of changes in economic policy introduced to the world's economy as a whole about 30 years ago, has set into motion a systemic disorder in the entire world's economy: a spiralling collapse of physical economy, a physical collapse caused by the insatiable appetites of an already vast, rapidly growing bubble of financial speculation, a systemic collapse-process comparable to a parasitical cancer feeding upon its dying victim.

Today, the only important economic policy-question confronting really intelligent thinkers in any other part of the world is: This financial system is doomed; can we put a new, healthy economic system into place

in time to prevent the political disintegration of our nations which must tend to occur in the wake of the financial avalanche about to crush the world as a whole?

What confronts us thus is not one of your famous boom-bust, cyclical crises in financial markets; this is a systemic crisis, in which case, either the relevant economic policies are destroyed, or the economy is destroyed. Under these conditions, any attempt to divert the discussion of this matter by seeking to forecast the day, or even the month a final collapse might occur, would be a pathetic sort of diversionary exercise in irrelevance. As long as present, monetarist forms of "deregulation" and related "free trade" policies continue to be tolerated, it will be impossible to prevent a financial and economic collapse of entire nations. When? One should answer simply, that unless we eradicate the "free trade" and related policies which caused this crisis, a total collapse of the system will come all too soon. Under any continuation of the policies currently defended by Wall Street and the so-called neo-conservatives, these Anglo-Saxon monetarist policies of the recent 25 years, it is absolutely assured, that soon, the entire planet will be plunged into the worst financial and economic catastrophe which modern history could recall since analogous Venetian bankers' policies produced the mid-Fourteenth-century collapse of Europe.

In any case, even if last-minute policy-changes save the world from a breakdown of the physical economies, the existing world monetary and financial systems are doomed. Any economic recovery will depend upon the creation and unleashing of large-scale state-credit mechanisms which operate in freedom from an old system which will then exist only in the repose of bankruptcy reorganization.

Under such present conditions, it is more obviously urgent that we not measure the relative performance of economies by the monetary yardstick of currency prices, but by the reality of physical output and consumption of households, farms, and manufactures. If we examine the matter according to those physical standards of measurement, the world's economy, taken as a whole, has been, incontrovertibly, in a continuing, downward spiral of collapse since no later than 1971.

There is no natural cause for this economic decline of both the Anglo-American and former Soviet systems. In both cases, bad policy, not nature, is the culprit. The presently ongoing collapse of the post-Yalta economic order of the Anglo-Saxon alliance has been brought about through a quarter-century of wrong-headed choices of economic policy and science policy generally, wrong policies of virtually every government and other relevant institution of this planet. Bad policy, not nature is to blame for this. If one jumps from the roof of a two-story building and breaks one's leg, please have the decency not to file a tort claim against the law of gravity; it was the bad policies which have been defended, or tolerated up to this time by most among the putatively educated citizens of the United States and other nations, which are directly the cause for the holocaust of misery consuming this planet today.



EIRNS/Michael Micale

A scene in Houston, Texas. When a nation's physical economy does not provide families with the essential components of a household market-basket, what chance is there for children to become the scientists and explorers of the future?

1. Rudimentary Comparative Studies Of Physical-Economic Time-Series

First, let us highlight the proof of the argument, that a collapse has been in progress continuously over the past 40 years. After that interpolation, let us proceed, with helpful side-glances toward the recently published report on my 1948-52 discoveries in the science of physical economy, to show the kind of philosophical thinking which must be understood, practiced, and taught by the leading intelligentsia of nations, if the political institutions of those nations are not to be misled into disasters of the sort now pushing this entire planet into a prolonged New Dark Age.

Any person literate in either a branch of the physical sciences, or industrial cost accounting, could readily prove this post-1971 collapse to be an incontrovertible fact, using the relevant, available historical statistics. An opening summary of the thinking needed to construct a statistical demonstration of that fact will clear the way for presenting the central point of this report.

Since describing that computation is merely neces-

sary background to the deeper issues of current policy-shaping, I shall outline the method of statistical construction as briefly and simply as the subject permits. To construct such measurements for the 1963-93 interval, we begin with a study of typical market-baskets of household consumption.

This includes the essentials of physical consumption, plus the two essential categories of services: health and education. The per-capita requirements for a household vary somewhat, of course. They vary according to the time in which the household is situated, and by the cultural level we are committed to achieving in practice through qualities of life-expectancy, health, rations of time allotted for education, and related development of both the household as a whole and the individual member, and so on.

What we require is a definition of a “standard household-consumption market-basket” based upon these elements. Let us ask ourselves, then: What is the kind of standard we require for comparing the case for different nations, or for the same or another nation in a different period of history? In practice, one should experiment with the changing statistics for any nation during a period of successful growth in both net domestic product and average standard of living: Examine the way in which actual household consumption varies according to both the economic-social characteristics of a household and its demographic composition. If one turns then to discussion of standard compositions of employment of a national labor-force in my textbook *So, You Wish to Learn All About Economics?* one should recognize the way in which one should proceed to construct a usable approximation of the standard required.

For example, prior to the eighteenth and nineteenth centuries’ implementation of Leibniz’s proposals for an industrial revolution based upon a system of heat-powered machinery whose technology was continually advancing, the existence of any society required that more than 90% of the labor force be employed in rural occupations. In contrast, if today’s technology were generally used, with farm prices at the level we term “parity,” less than 2% of a labor force is required in such modes of rural employment to satisfy abundantly the total population’s needs for agricultural products. This improvement in productivity depends upon a prior and maintained supply of needed industrial goods to the farmer, and also a relevant development of elements of basic economic infrastructure which include rail transport, electrical power supplies, and generalized water man-

agement.

The solution to the problem of defining a refined standard of household market-basket first appears as we attempt to compare our approximations of market-basket standards for households with the market-basket requirements per capita of agricultural and industrial production of physical goods. One gains thus an insight into the fact of a correlation of such kind between per-capita productivity in production of goods, and per-capita consumption of the physical, health, and educational requirements of the households which, inclusively, provide production with its labor-force members.

Looking at the statistics from this standpoint, we conceptualize more easily the nature of the interdependence of productivity with the quality of per-capita and per-square-kilometer development of such forms of basic infrastructure as general transportation, water management, power supplies, sanitation, and basic urban infrastructure.

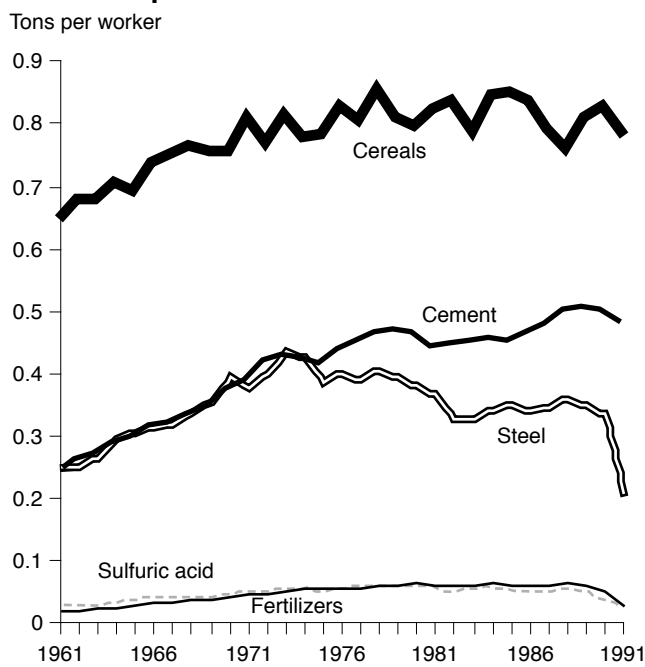
If we merely bear those kinds of analytical considerations in mind, the available U.N. and related statistics over the interval 1963-93 tell an incontrovertible story. In physical terms, over this period, the per-capita output of the total rural and urban labor force has been declining throughout the world as a whole; the fact that some regions of the world have been exceptional does not change the global picture (see **Figure 1**).

We can see, in this way, that the trend downward begins during the 1960s, with more and more suppression of the industrial development of nations in the southern hemisphere of this planet. The trend begins as an apparent slowing of the rate of economic growth, and then, during 1971-74, becomes an absolute decline in the so-called industrialized sector as a whole, in addition to the so-called developing sector. Even those national economies which do not go into absolute decline during the period 1971-81, are visibly affected by trends in the world around them. The overall condition of this planet during the 1980s is an uninterrupted, generally accelerating downward trend.

Let me speak of the relevant official and popular opinion in the United States. Similar observations are to be made on the subject of opinion in other countries. There are four principal reasons most people in the U.S.A. have been duped into accepting false 1980s or more recent reports of “economic recovery,” or even “prosperity.”

First, there is the credulity of the majority of the

FIGURE 1
World Output 1961-91



Source: FAO Rome, UNICPS

U.S. population today.

The influential Fabian Walter Lippmann proposed a Goebbels-like mass-media brainwashing of Americans in his famous book on public opinion; to similar effect and purpose, David Riesman made infamous the pathetic type of Twentieth-century North American which he named an “other-directed” personality. Hannah Arendt, the one-time lover of the Nazi regime’s chief Nietzschean philosopher Martin Heidegger, proposed that anyone who did not fit the model of this brainwashed, “politically correct,” other-directed type should be ostracized as what she termed an “authoritarian personality.” The average American, including the shallow-minded, highly suggestible “populist type,” has come to accept whatever themes are currently implicit in addictive forms of mass-spectator sports, Hollywood entertainment, popular quasi-music, and the mass news media, as axiomatically the basis for constructing one’s own “socially acceptable” forms of participation in “politically correct” forms of mass opinion.

Repeat often enough, Goebbels-style, that the basis of economy is “free competition in the market-place,” that economy is ruled by a mythical “law of supply and demand,” or the popularized lie that the U.S. Constitu-

tion was based upon John Locke, or the lie that the young U.S. federal economy was founded upon the ideas of Adam Smith, and the “other-directed” type of American will regurgitate that nonsense ritually as if he believed that were the holiest of eternal verities.

An included factor, the collapse of the quality of U.S. education, especially under the influence of Fabians and kindred types, such as John Dewey and his followers, had already damaged seriously the cognitive development of nearly all Americans even before the application of such New Age concoctions as the radical positivist “New Math” and other destructive innovations of the recent three decades.

The development of the cognitive capabilities of the young to the degree needed for a pro-scientific, rigorous quality of independent judgment, usually appears only through the form of education rooted in the Greek and later Classics, and emphasizing for instruction in mathematics, biology, and physics the student’s re-experiencing the original act of each important axiomatic-revolutionary discovery of his or her forebears. The misguided substitution of the textbook, and of generally accepted algebraic formalisms as a replacement for wrestling with Classical and other original sources has produced predominantly a type of graduate, even among those burdened with terminal scientific degrees, which Friedrich Schiller named contemptuously *Brot-gelehrten* (bread scholars).

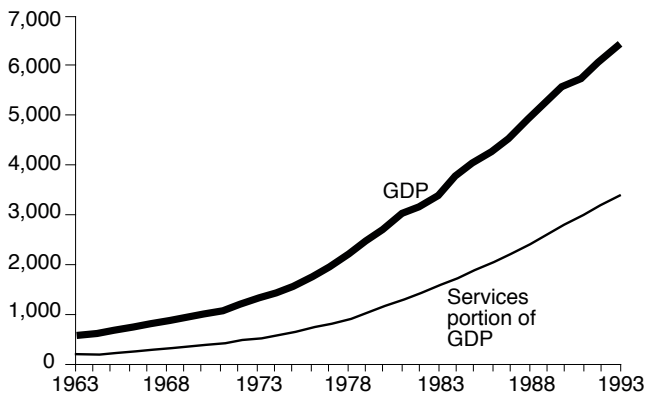
The result of substituting behaviorist modes of “learning” for development of independent cognitive powers of rigorous original discovery, has produced, among typical academic and other strata, a virtually total lack of capacity for independent thinking, especially respecting axiomatic qualities of assumption. This moral defect of judgment is often seen in its most extreme form in precisely those moments that an American asserts most loudly his “independent judgment” on a matter. Thus, do such foolish conceits of disordered public opinion render the politically correct true believer the better suited to be a victim of the silly opinions he or she is induced thus to adopt.

Second, current statistical practice of national-income accounting by governmental agencies, and by other widely influential reporting agencies, disallows any efforts at a rational distinction between a physically useless expansion of nominal income and useful production and consumption. For example, if prostitution and drug-trafficking were legalized, over \$500 billion would be added to officially reported Gross National

FIGURE 2

U.S. Gross Domestic Product, and Services Portion of GDP

(in billion of dollars)



Source: U.S. Department of Commerce

Gross Domestic Product is a fake concept. Between 1963 and 1993, fed by speculation, United States GDP rose from \$603.1 billion, to a level of \$6,374.0. During this period, Services as a component of GDP rose from, 39% to 54%, but even 'non-services' growth represented a huge element of fraud. During this period, when GDP allegedly rose 10-fold, sectors of the real physical economy were actually contracting between 30 and 50% or more, on a per-household and per-capita basis

Product (GNP), without any actual increase in anything but the credulity of the suggestible cohorts within the population (see **Figure 2**). Thus, a vast, parasitical burgeoning of notional values of financial gains in various purely speculative forms is counted as national income on the same basis as production of food, clothing, education, medical care, bridges, tunnels, railways, and industrial workplaces. As long as the nominal income from parasitical sources such as financial speculation is nominally greater in price than the margin of collapse of infrastructure, producers and households' goods, the official idiot-savants of the statistical and mass media communities will continue to insist, with a fanatic's menacing gleam in their eyes, that our national economy is either at the brink of recovery, or even being "overheated by an excessive rate of growth"!

Third, over all of the past quarter-century, but especially the recent decade, the official statisticians have lied more and more shamelessly, on almost every subject, most of the time. In addition, they have refused to deduct from gross national incomes the cost represented by the failure to repair and maintain essential elements of basic economic infrastructure, such as rail-

TABLE 1

Declining Installation of Turbine Generator Capacity by U.S. Electric Utilities

Year	Installed capacity (megawatts)	Per capita (watts)	Per household (watts)	Per km ² (watts)
1969	22,291	109.9	358.2	2378.3
1970	27,741	135.2	437.5	2959.7
1971	26,087	125.6	405.2	2783.3
1972	31,924	152.0	478.7	3406.0
1973	35,392	167.0	518.5	3776.1
1974	36,397	170.1	521.0	3883.3
1975	34,440	159.4	484.2	3674.5
1976	20,421	93.6	280.2	2178.7
1977	27,525	124.9	371.0	2936.7
1978	22,729	102.1	298.9	2425.0
1979	17,195	76.4	222.3	1834.6
1980	22,406	98.3	277.3	2390.5
1981	15,177	65.9	184.2	1619.2
1982	13,236	56.9	158.4	1412.2
1983	10,032	42.7	119.5	1070.3
1984	19,730	83.3	231.0	2105.0
1985	17,108	71.6	197.1	1825.3
1986	16,065	66.7	181.6	1714.0
1987	11,443	47.0	127.8	1220.8
1988	8,068	32.8	88.5	860.8
1989	7,312	29.5	78.7	780.1
1990	4,504	18.0	47.6	480.5

Source: Edison Electric Institute.

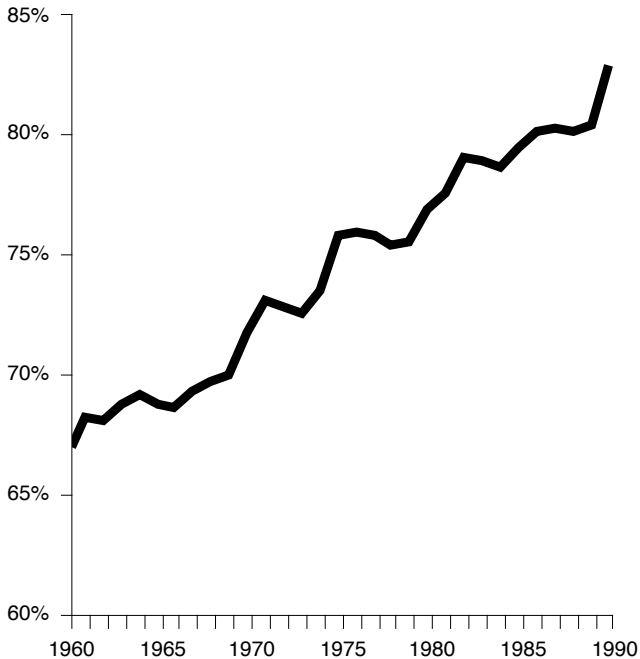
way systems, highways, bridges, water management systems, power stations and grids, and so on (see **Table 1**). In the United States, many trillions of dollars of never-existing "value added" have been added routinely, cumulatively, to construct false, greatly inflated reports of annual U.S. GNP.

Fourth, since the Ford Foundation's fraudulent, but influential *Triple Revolution* report of 1964, that doctrine of "post-industrial" utopianism has produced a malignant growth in the percentile of the total U.S. labor force which is either unemployed, about 17% or more today, or is employed in forms of "services" which add virtually nothing, or even less than nothing to either the net physical product-output or productivity of the U.S. economy (see **Figure 3**). Although most of the non-productive service occupations, as in the "fast food" distributorships, are paid wages way below the level required to support a household decently, the aggregate inflationary cost of these "services" is monstrous. The worst, the most savagely parasitical, are legalized gambling, recreational (illegal) drug-trafficking, and financial services.

FIGURE 3

U.S. Overhead Employment 1960-90

Percent of labor force



It ought to be plain enough, as a matter of relatively simple calculations, that such a replacement of productive employment by services is intrinsically a form of inflationary rot which must destroy the nation in the end, if the policy is not reversed. Yet, babbling so-called “experts,” whether as “talking heads” on the television screen, or elsewhere, have induced a majority of Americans to “repeat after me: The modern form of economy is a post-industrial, services economy.” The Wall Street emperor has no clothes!—but, the credulous crowd of onlookers to that paraded nakedness shouts its admiration of the marvelous fabrics and tailoring.

Credulous popular opinion aside, the scientific importance of stressing the pathological side of expanded rations of services employment is illustrated conveniently in the following way.

Up to modern times—in other words, up to about 550 years ago, even as recently as 300 years ago—over 90% of the population must labor in the rural life, simply to keep the whole society from collapse into mortal want. The margin of decrease of the required rural percentile of the labor force, which technological progress has made possible, was absorbed chiefly by a smaller but, initially, nearly proportionate increase in two categories of physical-productive employment: the

building and maintaining of basic economic infrastructure and the direct production of useful physical necessities for consumption by individual households or industries. President George Washington’s treasury secretary, Alexander Hamilton, accurately forecast this coordinate growth of urban industry and rural productivity in his famous official 1791 report to Congress, his outline of the anti-Adam Smith “American System of Political Economy” upon which our constitutional federal republic was founded, his *On the Subject of Manufactures*.

Also, in addition to the growth of the percentile of the labor force employed in urban production of physical goods, modern history’s successive transformations in the “structure” of employment have been accompanied by an, aggregately, relatively smaller margin of employment distributed among four categorical “overhead” elements of social cost which are not explicitly, directly productive of physical output or goods or infrastructure: education, health care, science and technology per se, and administration.

In general, the change into these directions, from the old, pre-industrial, bucolic base, is associated with three correlated developments: increase in per-capita physical productivity of operatives, increasing complexity of the social division of labor, and increase of power-flux-density. Among the principal other features of these directions in structural change of labor-force composition, we have the following. The absolute increase in level of technology, combined with the rate of that increase requires an increase of the segment of employment assigned to science and technology as such. The educational requirement is increased similarly, both cumulatively and with respect to the rate of technological progress. The educational and related culture requirements of the household members place a premium upon prolonging healthy longevity of the population, and what that implies otherwise. Justifiable increase in administrative burdens is chiefly a reflection of the growth of industry, education, scientific progress, and health requirements. Also, a continual increase in physical productivity, per capita and per square kilometer, correlates with an increase of the ratio of employment in producers’ goods production to employment in households’ goods production.

One point to be singled out here, is the danger of exceeding justified levels of administrative employment. The combination of unjustified burgeoning of sales and administration expenses, plus growth of re-

TABLE 2

Production Levels for Goods in Producers' and Consumers' Market-baskets on a Per-household basis (1967=1.000)

	1967	1973	1979	1982	1990
Consumers' market-basket					
Men's trousers	1.000	0.965	0.594	0.504	0.335
Men's shirts	1.000	0.644	0.486	0.343	0.165
Women's blouses	1.000	1.023	1.511	1.405	0.684
Women's dresses	1.000	0.597	0.503	0.339	0.279
Woven woollens	1.000	0.264	0.254	0.139	0.166
Refrigerators	1.000	1.247	0.935	0.703	0.932
Passenger cars	1.000	1.150	0.869	0.484	0.512
Tires	1.000	1.020	0.833	0.666	0.877
Radios	1.000	0.706	0.467	0.316	0.098
Producers' market-basket					
Metal-cutting machine tools	1.000	0.643	0.530	0.289	0.212
Metal-forming machine tools	1.000	0.854	0.730	0.404	0.406
Bulldozers	1.000	1.200	0.713	0.334	0.306
Graders and levellers	1.000	0.786	0.748	0.383	0.349
Pumps	1.000	1.140	0.541	0.424	0.506
Steel	1.000	1.029	0.821	0.416	0.487
Intermediate goods for either market-basket					
Gravel and crushed stone	1.000	1.023	0.914	0.624	0.575
Clay	1.000	1.022	0.759	0.459	0.544
Bricks	1.000	0.999	0.850	0.451	0.598
Cement	1.000	1.045	0.911	0.632	0.689

A production level for each item for 1967 was determined, and then divided by the number of households in 1967. This yielded a production level on a per household basis. For example, in 1967, the United States had 59,236,000 households and produced 86,014 metal-cutting machine tools. Thus, there were 0.001452 metal-cutting machine tools produced per household. The 1967 level was set equal to 1, and all subsequent years' production levels were compared to it. By 1990, the United States produced but 0.000308 metal-cutting machine tools per household, a level that was only 21.2% of what it was in 1967.

During 1967-90, production levels, on a per household basis for major goods contained in both the producers and consumers' market baskets fell between 7 and 90%, with most goods registering a collapse of 40% or more. This represents a fall in both the producers and consumers' market baskets as a whole, and shows the inability of the United States to reproduce itself.

dundant employment in questionable expansion of so-called "services," is an inflationary economic disorder akin to cancer in living processes, a sickness which could ultimately bring about the death of economies—as it has been slowly, but visibly killing the U.S. economy during the past 40 irrational years of continued

drift into post-industrial utopianism.

Once the implications of these observations are grasped, the usefulness of the following, somewhat simplified approach to comparative statistical analysis should be intelligible.

For estimating the relative growth or collapse of a national economy, or world economy over successive years, or decades, a good rough estimate can be made in the following way.

Make all measurements in terms of per-capita, per-household, and per-square-kilometer values. Measure basic economic infrastructure, agriculture, mining, industry (manufacturing, construction other than infrastructure), and employment in education, science and technology as such, and health-care. Measure consumption and production, coherently, as follows: market-baskets of household consumption (physical plus health, education), per household, per square kilometer and per capita; market-baskets of producers' goods, consumed and produced, per capita, per square kilometer and per household; ratios of producers' goods to household goods turnover, per capita, per square kilometer, and per household (see **Table 2**).

In examining these statistics, take special note of the following consideration. Distinguish between the productivity of labor as measured, on the one side, with respect to monetary price of direct labor employed, and, on the other side, productivity as physical economy measures it, the latter in terms of comparable physical ("market-basket") units of output. For example, in physical economy, measure the percentile of the total labor force of a nation required to sustain the essential contents of a household market-basket for all members of that labor force.

In the first, monetary case, a rough, first-approximation measurement is as follows. One subtracts from the wholesale manufacturer's price of produced goods sold, the price-cost of materials consumed by that production; this yields a difference, a gross margin, corresponding roughly to nominal (monetary) "value added by production." In the second case, we make a formally analogous rough measurement, substituting physical market-baskets of inputs and outputs of production; this defines a physical margin of "value added" per capita, per household, and per square kilometer. Let us concentrate now solely upon the physical measurement, in opposition to the monetary one.

First, refine the rough physical measurement. Let us make that physical margin of "value added" the numer-



USDA-C&MS Photo

Migrant laborers pick beans in New York. The “downsizing” of the productive sector, as corporations search for “cheap labor” at home and abroad, is a disastrous strategy for the U.S. economy.

ator of a fraction; make the denominator the total physical investment, per capita of labor force, in household and related consumption by productive labor, and of materials and physical capital of production. This calculation yields a useful estimation of productive “return on investment,” in physical, non-monetary terms. One obvious advantage of this enhanced estimation is, that it reflects more accurately the relationship between productivity at a local point of production and the productivity of the national economy’s productive sector as a whole.

To render such physical output comparable with physical input, we reduce each to its labor-content. This content is reflected, in first approximation, by hours of direct productive labor consumed in production. These raw hours, for each case of an item in the market-basket list, are corrected by an adjustment-factor. This compares the households’ market-basket of consumption of the actual direct labor employment in production of an item, with a standard consumption. That standard consumption is obtained by averaging total national consumption of direct labor’s households with the total number of direct labor employed in the nation. This provides a mean value of consumption per capita of direct labor for the average household of direct labor. That tactic provides the indexing of the actual case required. The mean-hour of industrial-engineering type of cost-accounting is indexed for each type of produc-

tion in this way.

Thus, it might appear to some Cambridge systems analyst who is thinking carelessly, or to a like-minded student of the input-output schemes of Wassily Leontief, that we are treating this as a case of apparent production of commodities by commodities consumed. In fact, we are employing such an assumption merely to refute it: The fact that when commodities are consumed by direct productive labor, apparently the commodities are modally reproducing themselves negentropically, reflects the function of labor, as distinguished from any

other form of consumption of produced items. Implicitly, we are refuting directly the famous axiomatic assumption of the Eighteenth-century French and Swiss Physiocrats. It is only the labor process which can impose willfully such forms of negentropic, or should we better say “evolutionary-type” transformations of functional processes to a higher state. This is adumbration of Genesis 1:26-28 as shown by the modal form of a durably successive form of society.

By taking the ratio of the activity of the productive sector’s labor-force households to the physical costs and income, per household, of the nation as a whole, a useful estimate of relative national productivity is obtained.

We may thus compare different nations, and the same nations during different periods: both in terms of their respective productive sectors, and the results of relating each productive sector to the nation as a whole in this way.

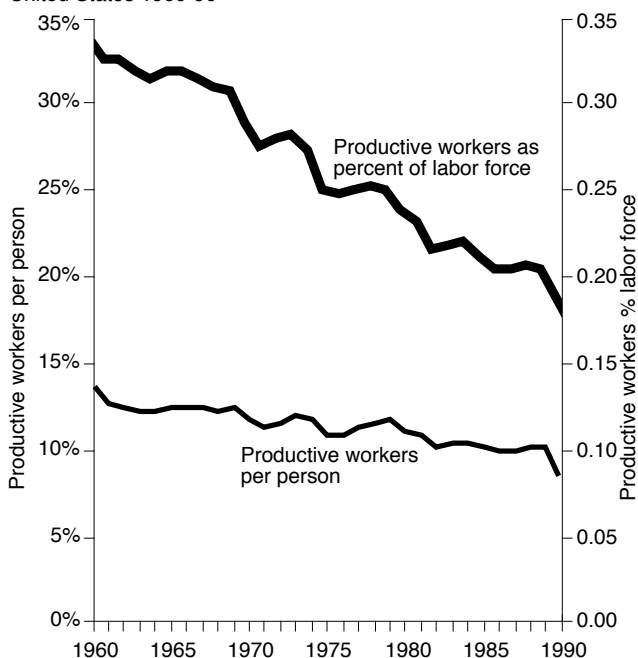
1.1 The Myth of ‘Cheap Labor’

This approach to estimating relative productivity of nations provides a simple, implicitly conclusive exposure of the fraud in British economist David Ricardo’s celebrated myth of a “comparative advantage” allegedly inhering in “cheap labor.” Our view of today’s widespread “free trade” delusion affords us a better approximation of the actual process of this past 20-odd

FIGURE 4

Productive Labor, People and Workers

United States 1960-90



years of the worldwide economic-collapse spiral.

On behalf of the proposition that a U.S. corporation, for example, should situate a new manufacturing plant in some underdeveloped nation noted for its favorable tax climate and supply of cheap labor, today's Wall Street financial houses console the North Americans who will lose their employment in this way: "If you wish to stop your jobs from flying away to cheap-labor markets, you have only to lower your wage-expectations to levels which are competitive with foreign competition." Similarly, in the university economics departments, the spin-doctors will assure all foolish enough to believe them, that cheaper imports from foreign sources are a boon to the U.S. consumer, and therefore a boon to the U.S. economy as a whole.

Imports are an actual boon to the U.S. economy, for example, under different circumstances than those referenced by such academic spin-doctors. If a technologically developed economy can move its culturally developed labor out of low-skilled employment into more highly productive, more technologically advanced modes of production, the total and per-capita productivity of the whole U.S. economy is increased to everyone's advantage. Thus, if we assign the less-skilled forms of market-basket item to a nation whose labor

force has yet to reach generally the level of the U.S. labor force, we are benefitting both nations by optimizing the utilization of the labor force of the less-developed nation, and maximizing the productivity of the relatively more developed one.

The directly opposite result would be the case if we moved chunks of the employed U.S. labor force either into unemployment status, or into less-skilled, lower-paid employment, or out of production of physical goods into services employment. In the former case, the U.S. economy would have the added production and income to be a market for the product of the developing nation; in the latter case, the purchasing power of U.S. households would be reduced, and, therefore, also the U.S. market as a whole.

In that reality which appears to exist only outside the mouths of free-trade ideologues, the effect of the "runaway shop," under today's post-industrial policies, is to shrink the percentile of the total U.S. labor force employed in producing useful physical goods. The displaced labor from these runaway industrial enterprises becomes either unemployed or employed in relatively marginal, even essentially almost useless occupations. The industrial purchases from U.S. suppliers, especially medium and smaller producers and maintenance services, collapse. The tax revenue base of the affected community is collapsed more or less severely. The "downsizing" of the per-capita scale of the U.S. agro-industrial producers' base, and the "downsizing" of the percentile of the total U.S. labor force employed in production of physical goods, signifies a collapsing of the U.S. economy's earned real purchasing power, and a collapsing of the U.S. economy below a physical break-even point (see **Figure 4**).

In consequence of this and other policies born of the same deranged, if media-popularized mind-set, we have the following picture of the U.S. economy itself.

Over the interval 1965-70, the rate of growth of the U.S. physical economy slowed toward a net zero growth for the economy as a whole (in terms of rate of increase of physical output per capita, per household, per square kilometer). The slowdown was triggered by the "downsizing" of the highly stimulative, "post-Sputnik" aerospace "crash program" and investment tax-credit programs upon which the post-1960 economic recovery from the 1957-60 recession had depended almost entirely. This "downsizing" was worsened by the combined influence of such "post-modernist" lunacies as Robert Theobald's *Triple Revolution*, Robert S. McNamara's

mara's lunatic "systems analysis," Herbert Marcuse's ultra-leftism, and sundry "post-industrial" utopianisms. The international effects of these and similar "New Age" policies led to Prime Minister Harold Wilson's November 1967 collapse of British sterling, and the ensuing first round of successive collapses of the U.S. dollar erupting visibly during February and early March 1968.

During 1970-71, the U.S. net expenditure on basic economic infrastructure (additions and replacements versus wear, tear, and obsolescence) entered a phase of negative growth which has not only continued, but accelerated downward to the present time. The resulting repair bill for water-management systems, transportation systems, power systems, general sanitation, and urban infrastructure generally now totals many trillions of dollars at constant-dollar prices. The combined Chrysler and Penn Central crises of spring 1970 signalled the next round of collapse of the U.S. dollar, leading to the collapse of the Bretton Woods gold reserve system during March through Aug. 15, 1971.

The further downsizing of the U.S. productive sector by the Nixon administration's successive, so-called "Phase I" and "Phase II," was followed, during 1973 and 1974, by the shockingly depressive effects of Secretary of State Henry A. Kissinger's arranging the OPEC oil-price hoax on behalf of the London-based oil multinationals, then known popularly as the "Seven Sisters." This disastrous direction in U.S. domestic and foreign economic and related policy and trends was accelerated by adoption of those sets of policies sponsored by David Rockefeller's Trilateral Commission and the New York Council on Foreign Relations' "Project 1980s." These included the "shock therapy" measures introduced by President Carter's newly appointed Federal Reserve chairman, Paul A. Volcker, in October 1979. Volcker's high-interest rate hoax, which had been put forward first in the CFR "Project 1980s," and backed by the Trilateral lobbyists, had an immediately catastrophic effect upon the U.S. economy. Thus, over the course of the 1970s as a whole, the U.S. economy collapsed in all productive sectors excepting a few electronic and related spin-offs of the Kennedy aerospace program; the rate of contraction of the U.S. and world economy, over the course of the 1980s was transformed into a virtually terminal collapse-process by the Anglo-American policies of 1985-92, especially those introduced by Margaret Thatcher and George Bush.

TABLE 3

**Water use for industrial purposes, 1970
(millions of cubic meters per year)**

	per household	per capita
United States	950	294
Germany	470	170
Japan	500	128
India	30	6
China	50	11

A critical feature of an economy's real economic development is its ability to supply itself with water. In 1970, the difference between three industrial nations (the United States, Germany, and Japan) and two developing sector nations (India and China) was significant. On a per household basis, the industrial nations deployed between 10 and 20 times the water to industry as the developing sector nations .. on a per capita basis, the disparity was even greater. Lawfully, this resulted, in part, in much higher industrial output in the industrial nations.

"Downsizing" has become an irrationalist, fanatical cult. This popular myth currently includes the delusion, that one could collapse 85% of this planet into plague-ridden barbarism, during a time as long as a century, and yet keep a residual 15% of this planet relatively secure and stable. This delusion is closely related to the false axiomatic assumptions underlying the popularized fallacy known as "comparative advantage" of "low taxes and cheap labor."

The ability to continue to produce physical goods of ever-better quality ever-more cheaply is an excellent, indispensable policy. This realization of this praiseworthy goal demands a constant emphasis upon investment in improved technologies generated by vigorous scientific progress in such directions as beyond the outer limits of present-day astrophysics and microphysics. This improvement in conditions of life also depends upon essential considerations of basic economic infrastructure; this requirement cannot be compromised without disastrous effects upon the economy.

In transport, for example: the promptness and cheapness of inbound and outbound passengers and freight. Availability of reliable water supplies (see **Table 3**). Availability of adequate power supplies of the required quality. Local communications. Sanitation. Education and health-care systems. Apart from that class of correlatives, a potential level of per-capita physical productivity is principally a function of health and cultural development of the labor force.

In all cases, these qualities of the local situation for

investment in production must be produced chiefly by, and at the cost of the society in which the investment is made. Either that society is able (and willing) to reproduce these required “environmental” preconditions, or it is politically unwilling to do so. If it is willing to do so, then that society as a whole must be repaid amounts sufficient to regenerate those improvements. Even were it willing, it might be incapable of doing so. If a large number of investors in a country pay so cheaply for their employed labor, and so forth, that the country is strained beyond the limit of its means to continue to reproduce these required “environmental” conditions, then a spiral of collapse is introduced by cheap-labor, low-tax fostering of such investments.

Otherwise, if the so-called “cheap labor region” in which the investment is made is paid generally sufficient tax revenues and wage-levels to enable it those necessary preconditions, then the labor in that nation will no longer be truly “cheap.” As the legacy of Eighteenth-century Dutch and British colonialism, and Nineteenth-century British imperialism show throughout the relevant southerly regions of this planet, the “comparative advantage” of cheap slave or paid colonial labor lies entirely in the power of the colonialist to conduct a mass-murderous, Nazi occupation-like type of asset-stripping of the population and natural resources of the subjugated region.

Thus, it is a matter of economic principle, that the true cost of producing anything, including the public sector’s contributions of general, national infrastructure, must be seen as the physical cost of reproducing and improving all of those natural and developed resources upon which the continued local production, even by a localized investment, of an equal or greater quantity and quality depends. Among the included actually incurred costs of an investment: each local investment in production must contribute its share to meeting the reproduction costs of the total population from whose households the labor employed is drawn.



EIRNS/Stuart Lewis

British-style free trade in action: the “street economy” in New York City. The unscientific axiomatic assumptions of the British East India Company’s Haileybury school are now generally accepted in ruling academic institutions around the world.

‘Asset-Stripping’

Since the mid-1960s turn, the U.S. financier interest has adapted to that induced physical collapse of the U.S. economy which its post-industrial policy has induced, responding to this collapse with an increasing emphasis upon sundry forms of asset-stripping. We should understand “asset-stripping” as various ways in which to make a financial profit by acquiring physical or monetary assets for resale by purchasing them at a price way below the replacement price for the physical assets underlying the notional financial values assigned to them. “Junk bond” dealings are one example of such looting. It will probably be helpful to many readers to present the following, additional example of commonplace “asset-stripping” practices.

In a typical case, a banker linked to the organized crime circles formerly run top-down by Meyer Lansky assists a credulous client’s investment today, but with the intent to loot him at some point down the line—make the calf happy with today’s fattening, that he might become a richer feast the day he is driven into the asset-stripping slaughterhouse. One day, often years later, after the investment has been “fattened up” by aid of what seemed to have been generously supplied

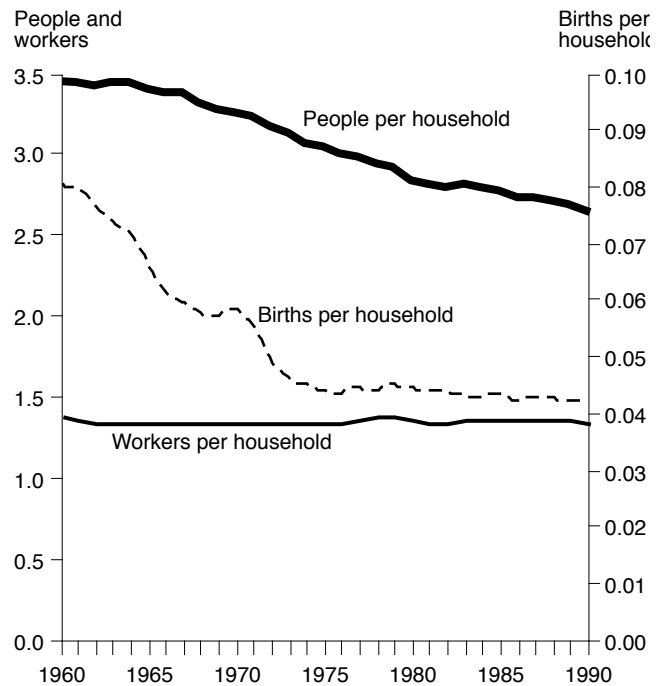
masses of credit, one of the creditors, not the original banker, mysteriously calls in a loan. Other things happen. The client is thrown into bankruptcy. His former patron, the banker, with an interest in the enterprise all along, buys out the other creditors by taking the assets at one or two dimes' worth for each dollar of replacement cost of those assets, and readily disposes of the assets so acquired for three or more dimes, at a 50% or greater profit in the relatively short term. In typical real instances of such widespread practices, this buyout of the bankrupted assets occurs by looting the original investor, the bank depositors of relevant banks, and sundry other creditors.

That and analogous forms of monetarist “downsizing” within an existing local, national, or world economy, generates a relatively substantial, if local rate of return, substantial relative to the notional value of base being shrunken physically by these means. One way of accomplishing this result, is to send a “runaway shop” into a cheap-labor market, to loot both the market and the basis of that national economy out of which the “runaway shop” has been wrenched. The already-referenced “junk bonds” are the same species of asset-stripping rip-off; so are “derivatives.” The London and Wall Street private bankers do not invest in cheap labor for the purpose of obtaining wealth from production; the only significant source of wealth from such operations is the wealth taken from a domain outside the production process itself, the looting of the host economy by the levers of exchange manipulations and of tax- and price-concessions. In short, this is accomplished through an asset-stripping operation, in which the production side serves only as a lever.

Another form of asset-stripping, is arbitrarily lowering the birth rate. The ability to maintain the whole economy on the same scale requires a reproduction of the labor force in that or an increased number of surviving post-adolescents of a suitable quality of cognitive development and health. For example, by eliminating new births altogether, or virtually so, one could lower the level of income required, per capita, to reduce the number of mouths to be fed sufficiently to reach temporarily an otherwise impossible level of market basket enjoyed by the survivors of this population-collapse spiral: Labor-force members from households without dependent children are much cheaper to employ, since they have fewer mouths to feed per member of the labor force (see **Figure 5**).

Similarly, by putting health-caps upon care for per-

FIGURE 5
Household Composition 1960-90



sons whose age is above 55 years, one could eliminate, Hitler-style, most of the older strata of the total population; this would lower the income required by the survivors, per capita, to maintain the current standard of living for the survivors. The significance is, that to have a population which could afford to provide the existing middle-range U.S. standard of income per capita, a population which describes an infant-based demographic pyramid with a modal life expectancy of up to 85 or more years, is required.

It was inevitable, that once the neo-malthusian fanatics had succeeded in their goals of dropping the birth-rate and introducing a “post-industrial” utopia, the Orwellian goal of killing off large fractions of persons who reach the age of retirement must be seen by the malthusians as the economically required next step. Reducing the birth-rate means reducing the economic basis for sustaining persons in retirement age-ranges. All “life-boat economics” of this sort, fairly called “Hitler-style economic policies,” have an analogous effect.

The use of asset-stripping forms of “privatization” of public education, combined with outcome-based education’s (OBE) emphasis on eliminating compulsory public education of cognitive potentials, is also an “as-

set-stripping” form of forerunner for Hitler-like health-care and other population-control measures tomorrow. Without a form of obligatory public education which emphasizes European civilization’s classics and a geometrical approach to development of the cognitive potentials, the result converges upon a deranged population reminiscent of Fourteenth-century European flagellant mobs, a population incapable of mastering the standards of technological proficiency required by modern agriculture and industry.

None of these “lower taxes,” “cheaper labor” forms of asset-stripping are truly sustainable forms of cost-control measures. They are, each and all, essentially one-time modes of deriving income from mass-murderous forms of asset-stripping of the accumulated physical and cultural wealth of our collapsing society.

Thus, in order to discover the approximate degree of post-1963 declines, during, respectively, the 1960s, the 1970s, the 1980s, and the early 1990s, one must consider first the apparent levels of output per capita, per household, and per square kilometer. One must deduct from this apparent output the amount of current physical wealth attributable to the various guises of asset-stripping.

The additional considerations to be applied to the statistics are presented in my referenced 1984 textbook. That taken into account, you have before you the outlines of construction for an incontrovertible statistical proof: Since 1963, the world economy has been declining in net production of wealth per capita, per household, and per square kilometer. This rate of decline has itself been increasing over that period, most emphatically the past ten years.

2.0 Smith, Ricardo, and Marx: British Imperialism’s Zero-growth Economists

During 1983-85, I forecast repeatedly, both in private and widely distributed published statements, an approximately 1988 collapse of the Warsaw Pact economic system, should Moscow refuse to reject the form of cooperation which President Reagan had proposed in his initial presentations of a Strategic Defense Initiative (SDI) offer delivered publicly on March 23, 1983. I also warned, similarly, from 1983 onwards, that under Anglo-American policies in force then and now, that the western economic system was also headed toward a

systemic form of collapse far worse than any mere cyclical depression. During the October 1988 U.S. presidential campaign, I warned a nationwide U.S. television audience of such things as the impending threat of a generalized Balkan war launched by certain Serbia factions, and also forecast an impending, early reunification of Germany under conditions of an imminent “East bloc” chain-reaction collapse. The collapse of the former Soviet system erupted in 1989; the intrinsically bankrupt Anglo-American financial system is now wobbling at the edge of a precipice.

The collapse of both systems was set into motion by policies introduced globally chiefly since the November 1963 assassination of President John F. Kennedy. The common feature of this past 20-odd years collapse of both of the planet’s dominant economic systems, the Anglo-American and the Soviet, is that, in both cases, the collapse was shaped chiefly by common defects of policy-shaping thinking. These defects are rooted axiomatically in the British East India Company’s Haileybury school of Adam Smith, Jeremy Bentham, David Ricardo, et al.

To understand why and how the world’s economy entered the past 30 years collapse-spiral, one must recognize that this collapse has been caused solely by the influence of those ideas of zero-growth economy which were embedded axiomatically in the thinking of Adam Smith and Karl Marx, and, more recently, in the “systems analysis” introduced to post-1938 economics by radical positivist John Von Neumann. One also must recognize that, contrary to popular opinion, economist Karl Marx was a follower of this British school in every relevant sense, not merely an admirer of what he so often alleged to be the unchallenged scientific superiority of that Smith-Ricardo school. It is also a relevant fact that, virtually all of his adult life, through 1871, Marx was a controlled asset of two of the principal control agents of Lord Palmerston’s foreign-intelligence service: London resident Giuseppe Mazzini and the British “Museum’s” chief controller of Marx’s education in economics, David Urquhart.

For the purposes of this report, we are interested only in a narrower aspect of Palmerston’s control over Marx. Although his work on economics is usually associated with the notion of “surplus value,” in every feature of the formal argument throughout the three volumes of his *Capital*, he is, mathematically, a zero-growth economist. On this point, there is no axiomatic difference between Marx and those whom he repeat-

edly acknowledged as his teachers, notably Smith and Ricardo. We stress that, as some postwar Cambridge University economists around Joan Robinson and Nicholas Kaldor have indicated, the formal side of Marx's *Capital* is readily restated as a relatively more sophisticated version of Von Neumann's zero-growth "systems analysis," that is, as a system of linear inequalities.

Kaldor's Cambridge Systems Analysis group, working closely with the malthusian Zuckerman-Alexander King Club of Rome, plainly influenced the direction of Soviet economic policy-thinking during the 1970s and early 1980s. That influence, exerted through such channels as Lord Solly Zuckerman and Dzherman Gvishiani's International Institute for Applied Systems Analysis in Laxenburg, Austria, did not cause the Soviet economic collapse; nonetheless, to those who observed this influence during that time, IIASA's conduiting of British systems-analysis influences into Moscow through that and other channels certainly blinded many relevant Soviet figures to the true causes of the catastrophe then in the making.

On the Anglo-American side of the collapse, the connection to Adam Smith is simple and direct. Radical versions of Smith's dogma are embodied axiomatically in the policy-thinking which is bringing the Anglo-American financial system to an early systemic collapse.

To understand such specific connection of bad economic theory to systemic collapse, we now treat in succession two successive, interrelated points. The first of these is the way in which the underlying assumptions of British economics dogma, since the eighteenth century, became rooted in today's policies of most governments and universities throughout the world. Secondly, we must examine rigorously the axiomatic connection between certain classes of ideas and material effects of those ideas in economic practice. The crucial economic implications of modern systems analysis, including the manner in which this radical version of Smith, Ricardo, Marx et al. has shaped the presently ongoing global economic collapse, can be understood only from that twofold standpoint.

In both of those facets of this subject-matter, the most crucial feature of this is the fact that the formal side of the economics teachings influencing both western and Soviet policy-shaping was derived from a doctrine whose formalities tolerate no economic policies which are not consistent with a zero-growth result.

Review briefly the definition of axiomatics. Later, we shall identify how the unscientific axiomatic assumptions of the British East India Company's Haileybury school became generally accepted in ruling Twentieth-century academic institutions around the world.

2.1 Axiomatics, Briefly

Let us be certain that we understand one another when we use the term "axiomatics." Stated most simply, we mean what the classic text in Euclidean geometry defines "axiom" to signify in practice. Unfortunately, there are many university science graduates today who, as victims of the so-called "New Math" curriculum introduced 30 years ago, were denied a competent grounding in geometry. Those who did receive such a grounding will please kindly bear with us as the meaning of the term is explained to those who did not.

Fairly said: In its classical usage, "axiom" signifies an assertion which is adopted without proof, adopted on the authority of the unproven assumption that any contrary opinion must be absurd (whether that assumption is relatively valid or false). For example, a "point" in taught Euclidean geometry is the smallest conceivable image in sense-perception, and a "straight line" is imagined to be, similarly, the shortest distance between two points.

Once these, and other axioms have been adopted as building-blocks for that species of geometrical thinking, no proposition (theorem) adopted must be inconsistent with any among the axioms. Thus, once we adopt any choices of axioms and postulates as a fixed set of underlying assumptions for any formal system, not only will every proposition generated within that system be consistent with each and all of those assumptions, but, each and every proposition which could ever exist within that system is implicitly stated in advance. This principle of formal systems, including all formal systems of mathematics, is sometimes known as the "hereditary principle" of a formal logic such as that of Russell and Whitehead's *Principia Mathematica*.

Since the formal aspect of the economic systems of Adam Smith, Karl Marx, and John Von Neumann each and all claimed to be logically consistent formal systems, this rule, the so-called "hereditary principle," applies to each and all of them. This brings into play a second formal principle of all logical systems, the so-



EIRNS/Carlos de Hoyos

A model for the investigation of conic sections, at the Franklin Institute of Technology in Philadelphia. Geometrical thinking is the axiomatic starting point for correct methodology in economics.

called principle of “types.” By treating each of these economic systems as sub-types of a common type, we are able to identify the cause of the presently ongoing, worldwide economic collapse in a simple and direct way.

For our purposes here, the following definition of that principle of types will be sufficient.

Once we show that each and all theorems possible within any logically consistent formal system are all embodied implicitly in a single “hereditary principle,” we can replace a listing of such theorems by simply stating that hereditary principle. To construct such a statement, we must present the set of interdependent axioms as a principle for generating, in some ordered or other succession, each and every theorem implicitly possible within that succession.

This leads us to an important, fundamental discovery first elaborated by Georg Cantor. This discovery was echoed by a Twentieth-century mathematician, Kurt Gödel. Gödel, by reconstructing a crucial feature of Cantor’s proof, discredited the most fundamental

mathematical axioms of not only Bertrand Russell, but also of the putative father of modern economic systems analysis, John Von Neumann. Leave the related Cantor topics of non-denumerable sequences and power sets untreated here today; the point relevant to our treatment of Smith, Marx, and Von Neumann, here, is fairly summed up as follows.

As Plato demonstrated this famous ontological paradox by his *Parmenides* dialogue: that unifying conception of change which, as a generating principle, subsumes and thus bounds all of the members of a collection cannot be itself a member of that collection. This was demonstrated in a fresh way by Cantor, a demonstration which Cantor situated explicitly in terms of Plato’s work, and which Cantor developed as a revolution respecting both the formal and ontological features of all possible mathematical thinking. Thus, if we state the “hereditary principle” of any formal system, such as today’s generally accepted university classroom mathematics, in its proper form as a generating principle, that statement lies outside the formal system of elements which it defines implicitly. That fact lies outside the reach of comprehension by today’s generally accepted mathematical thinking; but that principle is nonetheless intelligible, knowable.

The history of mathematics itself illustrates this point. The kind of mathematics which may be derived from the kind of set of axioms and postulates presented as Euclidean geometry, yields a form of mathematics called “algebra,” or “algebraic systems.” That is the kind of mathematics we associate with René Descartes or Isaac Newton. Over the interval 1440-1697, a higher form of non-algebraic mathematics was established, presented in this form at the latter date chiefly by Gottfried Leibniz and Jean Bernoulli. The higher form of non-algebraic mathematics came to be known as the domain of transcendental functions. The Euclidean axioms of point and line were discarded as axioms, and replaced by isoperimetric, or circular action, also known as a principle of “universal least action.” The establishment of non-algebraic mathematics as superior to algebraic forms, was demonstrated by the astonishingly accurate, 1670s measurement of the speed of light by Ole Roemer, and by the successive application of this measurement to principles of refraction by Christian Huyghens, Leibniz, and Jean Bernoulli.

Although Leibniz and his friends discredited the axiomatics of algebraic thinking, they took away nothing of importance to science. All of the valid features of

algebra are understood from the standpoint of non-algebraic mathematics, but free of the fallacies of algebraic thinking. It is shown that non-algebraic mathematics bounds algebra externally, but that, true to the paradox of Plato's *Parmenides*, the truth of non-algebraic mathematics cannot be derived by construction from a formal algebra. In the language of Cantor, algebraic and non-algebraic mathematical formalisms are two distinct species of "hereditary principle," or, distinct *types*, of which all valid propositions in algebra belong to a sub-type under non-algebraic functions. Similarly, Cantor showed the existence of a third, higher type of mathematics, beyond denumerable arrays, which is a higher type than any variety of today's generally accepted classroom mathematics.

The notion of (transfinite) axiomatic types applies to the problem under investigation here. The systems represented by the mathematically representable features of the political economy of Adam Smith, David Ricardo, Karl Marx, and John Stuart Mill belong to a common, Cantorian type of linear schema which is characteristically entropic, as, notably, Ludwig Boltzmann defines entropy in mechanistic models of a gas system, or any analogous system. The same is true of the systems analysis of John Von Neumann.

The fact that Boltzmann's model is axiomatically entropic leads directly to the following paradox. If the universe as a whole were subject to a universal law of entropy, as Boltzmann's mechanistic model implies, then Boltzmann himself could never have come into existence to construct his theory. Thus, if Boltzmann's theory is valid, then both Boltzmann and his theory never existed.

A scholarly defender of Boltzmann's work would raise an objection to our use of that paradox which is more or less the same point made by Boltzmann himself. That objection would be, that Boltzmann himself showed that non-entropic phenomena might conceivably exist locally within a universe which is overall entropic.

The rebuttal to this objection is, summarily, that such a defense of Boltzmann depends absolutely upon Boltzmann's own reliance upon choosing an incompetent definition of "negative entropy (negentropy)." For Boltzmann to have come into existence, he must be a living process which is capable of progressive, and efficient intellectual discoveries analogous in form to an evolutionary model of living processes as a whole, and also analogous to such inorganic forms of evolution-

ary self-transformation of a process as the generative principle, or type represented by the developed form of the Mendeleev Periodic Table of elements and isotopes. As an existing person, Boltzmann, despite his theories, did conform to such an evolutionary model. However, these evolutionary "models," including Boltzmann himself, are not represented by the way in which the purely mechanistic notion of "negative entropy" is defined mathematically by Boltzmann's theorem.

The claim by Norbert Wiener, for example, that Boltzmann's mechanistic model is a model of a principle of living processes, for example, is a plain chicanery. By the time Wiener wrote his *Cybernetics*, there was a well-established, rigorous distinction between the two types of systems, entropic and not-entropic; the formal history of this distinction began with Plato's treatment of the implications of the regular solids' unique construction. In modern science, Plato's argument is developed further by Luca Pacioli, Leonardo da Vinci, and is a central feature of the work of Johannes Kepler. The work of Plato, da Vinci, and Kepler is re-grounded on the basis of Leibniz's *analysis situs* and important later work in this direction by Gauss, et al.; the refinement of Mendeleev's Periodic Table by earlier Twentieth-century work, up through the 1930s, in nuclear radiation, fusion and fission, made clear what we ought to signify empirically and mathematically by our obligation to make a strict formal distinction between living and entropic processes. The attachment of the word "negative entropy (negentropy)," as a simple time-reversal of statistical entropy, to the non-entropic features of living processes was therefore childish word-play; and Wiener's application of the Boltzmann statistical theorem to define a common principle of human communication and living processes a patent sophistry, a hoax.

In physical economy, for example, negative entropy is properly represented in the following way.

The total consumption of combined infrastructural, producers and households' market-baskets of essential physical goods corresponds to a magnitude which modern practice commonly terms "energy of the system." The desired increase of the total output of production over the "energy of the system" previously embodied in the productive process, corresponds functionally to the relative "free energy" of that society as a process. The ratio of this "free energy" to that "energy of the system," is a correlative of the productivity of

that society considered as a whole. Follow this several steps further.

These magnitudes are considered in totality, but they are also considered functionally per capita, per household, per square kilometer, and per square kilometer per capita. In the successful cases, the increase in productivity lessens the per-capita amount of productive effort required to satisfy the maintenance of the required level of the energy of the system per capita. However, there are two other outstanding changes which are included among those required to sustain this rise in the ratio of free energy to energy of the system. As measured in physical, but not labor-time terms, the energy of the system per capita must increase. Similarly, the ratio of total infrastructure goods plus producers' goods, to households' goods, must also increase, although the absolute, physical magnitude of the content of the household's per-capita market-basket must increase. The satisfaction of those preconditions provides a model of what "negative entropy" must signify if we are to attribute to that term any degree of congruence with the distinctively anti-entropic characteristics of living processes. This model illustrates the required alternative definition of "negative entropy" if that term is intended to reference the distinguishing characteristic of any process which would have permitted Boltzmann himself to have come into existence.

This is also the model which an economic process must satisfy to generate a genuine margin of what Marx termed "surplus value," of profit to humanity as a whole. In the case of Adam Smith, David Ricardo, Karl Marx, John Stuart Mill, William Jevons, and John Von Neumann, the systematic formalities of their respective arguments all share the same axiomatic blunder central to both Boltzmann's and Wiener's mistaken mathematical definition of "negative entropy." They are each and all intrinsically zero-growth models, which, as policy-guides, would ensure axiomatically an entropic collapse of any economy foolish enough to tolerate them.

Smith Versus the Physiocrats

We are now situated to examine the way in which the zero-growth axioms were embedded in the work of Smith, Marx, Von Neumann, et al. Briefly, then, as follows.

The science of political economy was developed originally by Gottfried Leibniz over the interval 1672-1716. The Physiocrats, and Smith, Marx, Mill, and Von

Neumann after them were all adversaries of Leibniz in science generally, and in the field of political economy in particular. As economists, Smith, Marx, Mill, and Von Neumann were all philosophical adversaries of Leibniz from the standpoint of John Locke; Locke's model of society is key to understanding the common axiomatic fallacies of their economic systems.

The outstanding features of Leibniz's discoveries in physical economy included, first, his development of the notion of heat-powered machinery, and, second, his notion of technology. The first bears upon the increase of the average productive powers of labor of society as a whole through the use of heat-powered machinery. The second involves that increase in productive powers of labor which follow introduction of a principle of design of experimental apparatus of scientific discovery to tools, product-design, and machinery of production, all to such included effect that the per-capita physical productivity of society were increased by this means even without an increase in the throughput of heat-power per capita.

An alliance of certain aristocratic and financial-oligarchical forces mobilized to eradicate the influence of Leibniz's science of physical economy. The most important of these, until about 1783, were the so-called Physiocrats. Later, beginning 1763, during the rising political power in Britain, William Petty, the Second Earl of Shelburne, adopted Adam Smith as an agent of the opium-smuggling and slave-trading British East India Company, assigning Smith to study the work of the French and Swiss Physiocrats, to design a scheme for destroying the economies of both France and the English-speaking colonies in North America. Smith's apology for the British East India Company's morally objectionable practices, *The Wealth of Nations*, appeared as a Shelburne-backed anti-American tract in 1776. Smith plagiarized significantly the written work of leading French Physiocrats, such as Turgot, but also included the added, pernicious dogma, intended to destroy the economies of France and English-speaking North America, "free trade." Smith, Ricardo, Marx, Mill, Von Neumann, et al., are each and all direct outgrowths of the John Locke axiomatic model of political economy proffered by the British East India Company's Adam Smith.

In contrast, the U.S. Declaration of Independence was based upon Leibniz's "pursuit of happiness," in opposition to Locke's "pursuit of property." Similarly, what became known worldwide as the anti-British

American System of Political-Economy was set into motion under President George Washington through U.S. Treasury Secretary Alexander Hamilton's Leibnizian *On the Subject of Manufactures*, and the thorough complementary credit and national-banking policies set forth in Hamilton's reports to the U.S. Congress on credit and a national bank. The Leibnizian system of political economy, as the form of the future U.S. economy's success was described prophetically by Hamilton then, did correspond to a truly negentropic model, contrary to the entropic schemes of Smith, Marx, Von Neumann, and Norbert Wiener.

Of all of these anti-Leibniz economic dogmas, only the Physiocrats allowed a true profit to society as a whole, and that in a most eerie form. For Smith, Ricardo, Marx, Mill, and Von Neumann, profit is something gained by one person out of the pocket of another, as trading profit, as usury, or some outright speculative swindle such as today's "junk bonds." In Von Neumann's language, for them, as for today's Malthusians, economy is a giant, all-seasons gambling hall, an "n-person, zero-sum game." By contrast, the Physiocrats argued that all net growth of the wealth of society per capita is generated solely as the "bounty of nature," not man's productive labor. Implicitly, these French rural oligarchs were pagan worshippers of the Delphi Apollo cult's earth-mother and whore goddess, Gaia. The Physiocrats' favorite prostitute, Gaia, produced all gain in wealth; labor were merely as cattle grazing in Gaia's field, munching upon Gaia's bounty. The landlord, by owning a piece of land, had the only legitimate title to Gaia's bounty, like the man who had rented the pleasure to an hour of Gaia's services as a prostitute.

The human species is known to have lived on this planet for no less than about 2 million years. It appears, that about that time and later, our species had a planetary potential population-density of less than 10 million individual persons, about the potential of a creature resembling the baboon in every respect but man's inferior strength and fighting capacity. Had mankind been merely an animal, mankind today would still live in no more than those numbers and with approximately the same table manners. The characteristic of those changes in potential population-density which have brought us to this time is an increase in both standard of living and productivity expressed in both per-capita and per-square-kilometer terms. This Cantorian type of increase in potential population-density is rooted in those mental

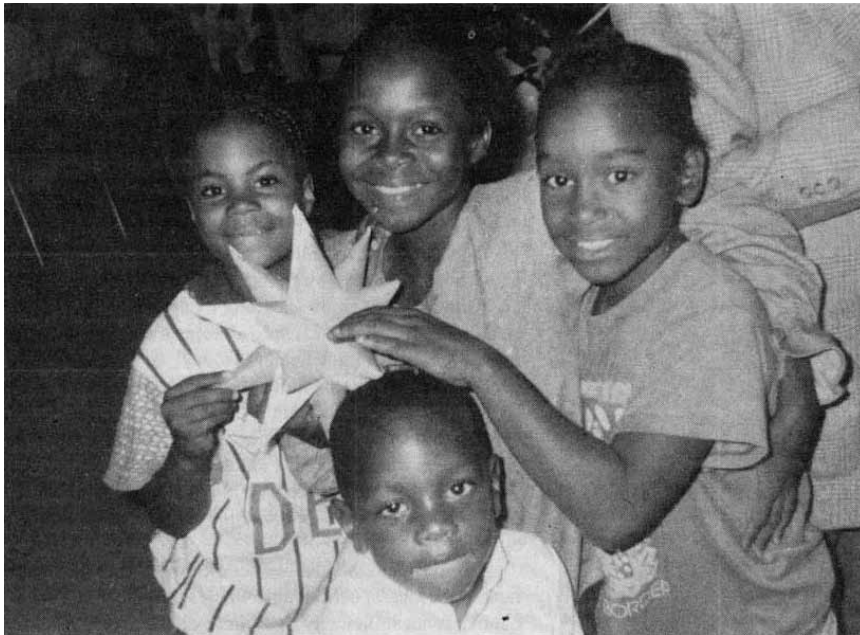
capacities of the individual human person which permit mankind to generate and to assimilate efficiently those axiomatic-revolutionary discoveries in science and fine arts through which man's per-capita power over nature is increased.

In respect to any formal system, such as generally accepted classroom mathematics, an axiomatic-revolutionary discovery appears as an absolute mathematical discontinuity.¹ Animal and human behavior must be contrasted axiomatically in these terms of reference.

It would be an exaggeration, to say that the range of behavior of an animal species is delimited in a way which corresponds neatly to a notion of the formal logician's "hereditary principle." We can say, that members of animal species cannot transmit axiomatic-revolutionary forms of discoveries, as conceptions, from one generation of that species, to the next. It appears that, in sharp contrast to the human species, an animal species cannot willfully improve its behavior in the way the radiation of an individual person's scientific discovery of an axiomatic-revolutionary quality is the cause of a revolutionary advancement of the potential population-density of the human species.

Although "animal intelligence" does not correspond simply, ontologically, or otherwise to any system of formal logic, animals lack that principle of intelligent behavior which otherwise sets intelligent behavior apart from, far above any formalist's view of today's generally accepted classroom mathematics. "Animal intelligence" manifestly shares one quality with formal

1. Cut one line with another. If we make the second of those lines sufficiently thin, can it become the case that the length of the first line coinciding with the second will be a point on the first line for which there is no denumerable determination of exact position? "Yes," says Cantor's demonstration. This issue was already featured in such locations as Bernhard Riemann's 1854 Habilitation Dissertation; the model of the problem was introduced by Richard Dedekind. It was central in the work of Cantor's teacher, Karl Weierstrass. This is a true mathematical discontinuity. Asymptotic limits which are true discontinuities are therefore never existing theorems of a continuous function which they bound. For an example of this latter principle, compare B. Riemann's construction of his *On the Propagation of Plane Air Waves of Finite Magnitude*, published in 1860, in which the central point is this notion of an asymptotic limit as a singularity which is not a theorem of the function which it bounds. Similarly, true axiomatic-revolutionary discoveries are not themselves functions (theorems) of the formal (e.g., mathematical) system which is their putative point of origination. Similarly, a series of such functions, as a Cantorian type, is a quality of function which resides outside all generally accepted classroom mathematics, yet inclusively bounds the latter externally.



EIRNS/Elijah Boyd

Construction of a stellated dodecahedron at a geometry class at the Child o' Mine day care center in Southeast Washington, D.C. "Reaching back... to recent millennia of European culture, we can trace all that we know of the roots of modern science through early discoveries in geometry, such as the Pythagorean theorem, Eudoxus's principle of exhaustion, and Plato's treatment of the regular polyhedral solids."

logic; it excludes ontologically the distinguishing, creative characteristic of human reason.

Human knowledge up to the present day is the continuing elaboration of an accumulation of successive, axiomatic-revolutionary discoveries over perhaps as far back as 2 million years. Reaching back less distantly, to recent millennia of European culture, we can trace all that we know of the roots of modern science through early discoveries in geometry, such as the Pythagorean theorem, Eudoxus's principle of exhaustion, and Plato's treatment of the regular polyhedral solids. With less exactness, but with essential certainty, we can trace back certain features of this development of science to times and places long before Classical Greece, chiefly through the development of solar astronomical calendars: before 6,000 B.C. by channels of the Vedic culture of Central Asia, through such channels as Egypt before the pyramids, and also from the ancient roots of China's culture, perhaps earlier than 15,000 years ago. In general, we can prove geometrically that each step among even those more remote discoveries required an axiomatic discontinuity with respect to any attempted formal representation of a preceding state of knowledge. We also know that such discoveries have an implicit, although not neces-

sarily denumerable successive ordering, an ordering determined by the notion of necessary predecessor.

We have shown earlier in other published locations a similar, philological and physiological case for the rational development of European Classical music, for example, from the vocalized poetry of many thousands of years ago, through the necessary, most recent development of Classical polyphony by Haydn, Mozart, and Beethoven: all on the foundation of earlier development of Florentine methods of *bel canto* voice-training and of J.S. Bach's more immediate well-tempered revolution in counterpoint.

To grasp adequately this principle of axiomatic-revolutionary discovery, otherwise termed "Platonic hypothesis," we must rise above the popular myth of so-called "scientific objectivity," to the higher vantage-point of "scientific subjectivity." This is the place in the present report to supply the following interpolation.

Science as Classical Poetry

Contrary to prevailing opinion among today's professionals, and also contrary to today's popular opinion, the "secret," if you will, for accessing true human knowledge was presented in a fresh way by Georg Cantor's treatment of the transfinite. At this point in our report, that principle of knowledge is located by "triangulation" of three points of reference: Cantor's principle of transfinite *types*, Cantor's direct comparison of that principle of the higher mathematics with Plato's treatment of the relationship between the *Becoming* and the *Good*, and a comparison of Cantor's work and Plato's method with the inner artistic principle of composition of Classical tragedy. We now describe that summarily, as follows.

In each of those three facets of today's accumulated human knowledge, and in all taken together, we see that, relative to any attempted formalist representation of knowledge, that knowledge exists in no such formalism, but rather in no less than that Cantorian type of principle by which each and all successive phases of man's progress are ordered. To sum up this point in the



Hale Observatories

A spiral galaxy in Ursa Major (32 NGC 5457). "Perhaps we shall not reach deeply enough into the interior of the atomic nucleus until we have completed the appropriately corresponding work of exploration of space."

simplest admissible terms: In contrast to a formalism, such as today's generally accepted classroom mathematics, knowledge is not symbolic, but is premised upon a process of successive axiomatic-revolutionary discoveries. Knowledge lies not in any among those successive discoveries as individual elements of a series, nor in an formal construction derived from a collection of such elements. In contrast to the formalist standpoint, knowledge appears as a succession of those "mathematical discontinuities" which mark the formally impassable boundaries separating the lower form of knowledge from the higher.

These boundaries, these singularities are bridgeable only by that principle of discovery under which Plato subsumes commonly the distinctions among hypothesis (discovery), higher hypothesis (principle of successive discoveries, or type of discovery), and hypothesizing the higher hypothesis (the ordering of revolutionary improvements in method of discovery).

As a matter of contrasts, modern empiricism is formally *reductionist*. It seeks to find the smallest, ostensibly indivisible element of matter, to the purpose of defining the universe as a whole inductively, by building upon the assumedly most elementary relationship among the most elementary building-blocks of matter. As that reductionist method is exemplified formally in

the extreme by Bertrand Russell and Alfred North Whitehead's *Principia Mathematica*, such radical empiricists or positivists adopt the same fallacy met in today's popularized neo-malthusian foolishness of "non-parametric" statistics: the absurdity of seeking a substitute for causality within the empty expanses of bare linear space-time.

On the contrary, the ontological principle illustrated by Plato's *Parmenides* obliges science to seek knowledge by ascending to that inclusive whole which is not comprehensible as a member of the set which it externally bounds and defines. In a sense, we must find the pathways to the secrets of microphysics in astrophysics; perhaps we shall not reach deeply enough into the interior of the atomic nucleus until we have completed the appropriately corresponding work of exploration of space. We must find the lawful basis for causal determination of the relationship among parts in the principles of ordering of the universe in the astrophysical very-large.

It is relevant, that the most ancient known roots of modern physical science may be found, tens of thousands of years ago, in the solar astronomical, long-cycle calendars of Central Asia from which historical Indo-European and Chinese civilizations sprang. Coming nearer to today, we have similar evidence of the development of solar astronomical calendars in Egypt long before the great Pyramids were designed. According to such ancient evidence, even before historic times, any culture which lacked a calendar of more than 26,000 years, based on a sound conception of sidereal and solar cycles, was pathetically poor in its relative cultural development.

It is indispensable that we seek knowledge in the highest rank of the largest conceivable wholes, not the smallest part; but that is not sufficiently rigorous, by itself. We must examine the accumulation of human knowledge by means of a constant criticism of our own thinking-processes at each stage of generating, regenerating, and transmitting scientific knowledge. In each successive phase of this process, we must attain a higher level of conscious reasoning by adopting the relatively lower levels of our own thinking as the sensuous-like objects of consciousness. This is the method of Plato's Socrates, of ferretting out and rendering intelligible the often hidden, often provably false axiomatic assump-

tions which underlie carelessly a tolerated blind faith in that received as authoritative opinion.

What else could be a more useful method today? Virtually all governments have been ruining the planet over decades, by tolerating generally accepted academic opinions on economics, opinions which have all long-since proven themselves, by events, to have been virtually a global mass-suicide pact among nations.

It is not sufficient to accept the fact, that we must achieve conscious control of those blind assumptions which govern the tongues of the illiterate Ph.D.s, and of others today. To render this Platonic method, and its terminology, truly intelligible, Plato himself would have considered it quite proper that we imagine this Socratic process as like a classical tragedy being performed before a theater audience. After all, are not his dialogues written as dramas? The players are performing the script on stage. The audience is watching the minds of each of the characters on stage, and the playwright, seated in a box above both stage and audience, is watching the minds of the members of the audience, and thus seeing his own mind's activity more clearly in that way.

Let it be said, in memory of Plato, Dante Alighieri, Leonardo da Vinci, Rafael Sanzio, Johannes Kepler, and Gottfried Leibniz, that without a mastery of the Classical fine arts, there can be no true physical science. Without rejecting the irrationalist, romanticist aesthetics of Immanuel Kant, the skills of the physical scientist dwell in but a small imperilled oasis within a Dionysiac wilderness of a Wagnerian opera, within the irrationalist, romantic mind of a raving, existentialist beast. Unless the leaders in physical science reject Kant and Friedrich Karl Savigny's barbaric dichotomy of *Naturwissenschaft* (natural science) and *Geisteswissenschaft* (art), unless they reject contemptuously the existentialist lunacy of "art for art's sake," physical science as a whole tends to become sterile; powers of creativity are lost, and only the soulless formalities of a no longer creative, dead science remain, until even that, too, is rotted away. "The play's the thing, to catch the conscience of the king"; in the great Classical tragedies of Aeschylus, Miguel Cervantes, William Shakespeare, and Friedrich Schiller, the doors to the innermost secrets of creativity in natural science are opened for the sake of those willing to enter. Imagine the tragedy as a Plato dialogue, and discern the structure of that dialogue to parallel Cantor's exploration of higher reaches of the transfinite.

Imagine that that play we chose to watch, follows the practice of such classic Platonic tragedies as Cervantes's celebrated prose-drama *Don Quixote*, in which the characters within the tragedy step briefly out of their roles to address the audience in soliloquies. These soliloquies have the effect of a character's showing his or her awareness of the audience; but, there is a certain ambiguity about this: Is the player speaking to the audience in his capacity as the character portrayed, or as the actor playing that part? As the audience is watching the drama, the drama is looking into the mind of the audience; this is the case at the same time that the soliloquist is presenting a view of the state of mind of the characters within the ongoing drama.

The common essential of all these relations, within the performance of the author's drama before an audience, is conscious viewing of consciousness as were that latter consciousness itself a sensuous object. The audience is watching the consciousness of the characters portrayed, as it is prompted to do so by such devices as Shakespeare's or Cervantes's soliloquist. The playwright is focused upon the conscious processes *within the minds of the members of the audience*. In a great tragedy, such as the *Prometheus* of Aeschylus, the tragedies of Shakespeare, and, most clearly of all, of Schiller, the interplay inhering in one consciousness being treated as an object by another consciousness is a truly Socratic dialectic.

All true human knowledge is Socratic in that sense. We touch knowledge as we rise above the beasts, as we rise above the empiricist's folly of knowing no objects but his blind faith in his felt reaction to the object-images of his sense-experience. Knowledge begins as we shift our attention away from his faith in his sense-perceptions, as we begin to search out the hidden, axiomatic assumptions which permeate and control the way in which we judge our own, and others' conscious processes of judgment, of opinion-making. Knowledge begins as we explore the implications of making indispensable modifications of those previously hidden assumptions which we are able to uncover, those axiomatic beliefs earlier hidden from our awareness.

Thus, great drama, especially the great classical tragedy reflected by such as Aeschylus, Shakespeare, and Schiller, is a wonderful, health-giving stimulus, a taking of pleasure in scientific rigor. Merely accepting a taught formal mathematics, is learning, not knowl-

edge. As both the known and hidden axiomatic assumptions of all mathematics are treated as conscious processes, which are, in turn, properly objects of conscious criticism, that joyous experience which is truth-seeking knowledge begins.

This dramatically Socratic criticism of assumptions is no merely arbitrary negation. This point is conveniently illustrated by recognizing that Cantor's discoveries are a reflection of that same method of exhaustion we meet in the work of Plato and Archimedes, for example. The principle of solution in the case of Plato's *Parmenides* ontological paradox, as Cantor and Kurt Gödel have addressed this successively, is key to understanding the way in which the method of exhaustion succeeds. Briefly, we have the following.

Given, the recent 2,500-odd years of known history of civilization, and of education: The formal side of the proper education of the child, for knowledge instead of today's slap-dash, behavioristic learning, comes into focus near the onset of adolescence, with the study of classical geometry, and a concurrently included study of Classical Greek culture from the reference-point of Plato's dialogues. In contrast to such stupefying empiricists as Peretto Pomponazzi, Francis Bacon, John Locke, David Hume, and so forth, Plato aids the student in overcoming the bestiality of blind faith in sense-experience as such. Viewing Classical Greece through the eyes of Plato, one sees that knowledge begins by rising above contemplation of blind faith in sense-experience, to examining the states of consciousness associated with judging sense-experience.

The method of judging is typified by Eudoxus's principle of limits. Drive every assumption to its limits, seeking out the way in which the ontological paradoxes, of the type presented in Plato's *Parmenides*, are forced into consciousness. So, the higher (than empiricist) state of consciousness associated with Platonic *hypothesis* is made a subject of consciousness. Our awareness of a state of consciousness of *hypothesis* as a Cantorian type, is consciousness of *higher hypothesis*, and so on. Thus, the secrets of physical scientific discovery are embodied in great dramatic tragedies.

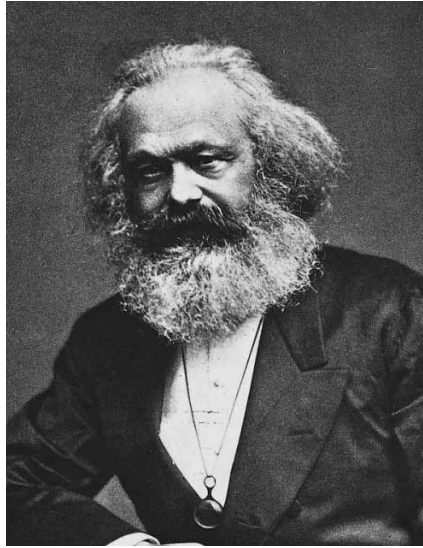
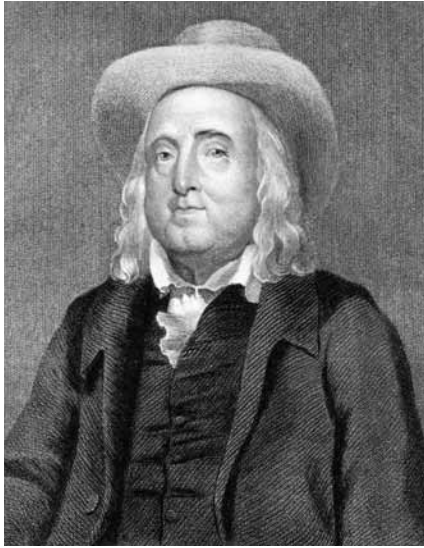
The limit which situates the hypothesis of axiomatic-revolutionary discovery, is always as Plato's *Parmenides* defines it. This is the definition illustrated by Nicolaus of Cusa's revolutionary solution to Archimedes's formulation of the paradoxical chore of squaring the circle. By leaping directly to the outer limit of a

process of generating ever-more many-sided, regular, inscribed and circumscribed polygons, it is shown that such an increasingly precise method for estimating a numerical value of π could never bring congruence between the perimeters of the polygon and that of the circle. The two are of different species, the principle of *circular action* the superior species bounding "externally" the process of generating the polygons.

In that circa A.D. 1440 discovery by Cusa, we have the axiomatic germ of Leibniz and Jean Bernoulli's demonstration of a non-algebraic form of universal least action. Similarly, Carl Gauss's derivation of his *pentagramma mirificum* from examination of the principles of Keplerian regular and semi-regular partition of the internal surface of a spherical shell, is a fresh insight into the nature of the Golden Section in respect to the Platonic solids, not as a coefficient in Galileo's dynamics, but as an external bounding of a geometrical process driven to its limit.

Cusa's discovery of the absolute distinction between a circle and *circular action*, the germ of modern transcendental functions, is taken as an intelligible example of the principle of hypothesis. Grasp that discovery in terms of the type of generating principle to which it belongs; reach thus an intelligible representation of the notion of Platonic higher hypothesis. Once the preconditions for Cantor's work are seen in this kind of classical-tragic dramatic setting, as prompted by the relevant paradoxes treated earlier by Gauss, P.G. Lejeune Dirichlet, Bernhard Riemann, and Karl Weierstrass, the students' consciousness is lifted above the chimeras of naive denumerability, and the once awesome face of hypothesizing the higher hypothesis assumes friendly, intelligible form.

Cantor's writings reflect his own experience with such discoveries. Yet, more stunning at fresh encounter than even all the reflection upon the role of hypothesis in scientific discovery, is the re-reading of Philo *On Creationism*, and the Christian writers on the interrelated topics of *imago Dei* and *capax Dei*. Acknowledge Plato's conceptual distinctions between "Becoming" and "Good," as Cantor insists that these parallel his own distinctions between "transfinite" and "absolute"; see then the meaning of *imago Dei* and *capax Dei* as that species-nature of the individual person which, according to Genesis 1:25-28, sets mankind absolutely above all other existence within a temporal universe.



Contrary to the beliefs of empiricists like (left to right) Jeremy Bentham, Karl Marx, and John Von Neumann, the historical increase in mankind's potential population-density sets man apart from and above all other creatures, and defines individual persons as in the image of the Creator.

Man's ability to replicate the behavior of Aristotle and Bertrand Russell's formal logic, we can simulate by a mere machine designed to handle such ontologically trivial matters as simultaneous linear inequalities. Poor Aristotle, poor Immanuel Kant, poor G.W.F. Hegel, poor Russell; one must wonder if they are not condemned to reside in Dante's Inferno forever, their tantalizing punishment that of being instructed monotonously throughout eternity in "the practical reason" by one of poor John Von Neumann's machines! Their crime, for which they might be punished so appropriately, is that their evil life's work was devoted to preventing their dupes from discovering the beauty of what it can be to be human.

The form of the interdependent qualities of *imago Dei* and *capax Dei* is reflected uniquely in that quality of supra-formalist creative reasoning which is directly illustrated in valid axiomatic-revolutionary discoveries in science, and in analogous discoveries in the Classical forms of the fine arts. From the standpoint of making ourselves conscious of the successively higher layers of our own capacity for scientific and artistic thinking, we recognize hypothesis, if but negatively, at the paradoxical, Eudoxian limit typified by Plato's *Parmenides* and Cusa's *De Docta Ignorantia* and *De Circuli Quadratura*. We recognize creativity, in its form as hypothesis, as the formal discontinuity implicit in any axiomatic-revolutionary form of discovery.

With those considerations of scientific progress as a

subject of Classical tragedy in view, now view the conflict among Leibniz, the Physiocrats, and the British free traders as such a tragedy.

The Tragedy of Empiricism

The essential falsehood, the lie upon which the teaching of the Physiocrats, Adam Smith, Jeremy Bentham, Karl Marx, John Stuart Mill, and John Von Neumann is commonly premised, is the same lie about mankind for which Aristotle, Kant, Hegel, and Russell might be justly tantalized forever in Dante's Inferno. Contrary to such persons, that historical increase in mankind's potential population-density which sets mankind apart from and above all other creatures within temporal eternity, defines individual persons as in the imperfect image of the Creator. This is so by virtue of manifest powers of axiomatic-revolutionary forms of efficient creative powers: in Latin, the powers of *imago Dei* and *capax Dei*.

One of the subjects of this report is, that those customary pagan Gaia-worshippers, the Physiocrats, deny such creative powers to man. It is appropriate that the core of these Physiocrats was provided by a political union of feudal landlords and financial usurers, like the North American defenders of the institution of chattel slavery. In the opinion of such worshippers of that old whore of Babylon earth-mother, it is a capital crime of *hubris* to attribute the image of the Creator to that mere serf, or slave for whom they would care no more, per-

haps less than the cattle they compassionately fatten for slaughter.

Adam Smith's employers were a late-Eighteenth-century variety of British Liberals, radical empiricists. Therein lies the nub and source of their differences with the Physiocrats.

The Physiocrats, together with their allies among the banker usurers, were defending their traditionally greedy bucolic's forms of feudal oligarchism, defending their usurious social customs, so to speak, against the encroaching social, economic, and political outgrowths of the fifteenth century's, Florence-centered Golden Renaissance.

The radical empiricists Earl of Shelburne and Jeremy Bentham exhibited the point of conflict with the Physiocrats, as they, from London, directed the Jacobin Terror of their agents Orléans, Robespierre, Danton, and Marat against France. The British East India Company's radicals were the Physiocrats' allies against the heritage of the 1439-40 Council of Florence, but were unwilling to subordinate their rapacious utilitarianism, their neo-Roman lust for world empire, to the restraining force of any form of social custom, even that their sometime feudal Physiocrat allies. So, later, did Lord Palmerston's "Young Europe" revolutions of 1848-49 treat Britain's faithful allies Metternich, the czar of Russia, and the king of France most ungratefully.

Formally, there are two essential differences between the empiricists and the best spokesmen among the Physiocrats, Quesnay and Turgot. First, the best Physiocrats have a clear sense of the structure, if not the functional characteristics of the productive process, where the empiricists, from Smith through John Stuart Mill and Jevons, never have. It is essentially on this single count of Marx's debt to Quesnay that he is superior as an economist to his Haileybury predecessors, and to the modern monetarists. Secondly, the leading Physiocrats believe in the existence of a net social profit to society as a whole, whereas the empiricists do not. Although Marx the economist is superior to Smith and David Ricardo on one point, he is otherwise, mathematically, the faithful follower of Bentham and Ricardo. That said, we have situated ourselves to concentrate upon the formal side of empiricist economics.

The key to a mathematical reading of the economic dogmas of Smith, Bentham, Thomas Malthus, Ricardo, Marx, and Mill is the social doctrine of John Locke. In Locke's system, society is merely the aggregation of a large number of discrete, neo-Aristotelian particles,

people, into an interacting, polymorphous tangle defined essentially by the consideration that each of these particles is motivated by nothing more than three primary impulses: to stay alive (Life), to pursue sensual gratifications (Liberty), and greed (Property). For Locke, there are no "innate ideas." Excepting a lively, utterly amoral libertarian zest for greed, the individual is born a "blank slate" (*tabula rasa*). This, Locke's definition of "human nature," serves as the axiomatic basis for the "hedonistic calculus" of Bentham, and, later, the radical-positivism "systems analysis" doctrine of Von Neumann et al.

Each and all of the formal systems presented by Smith, Marx, et al. demand no more sophisticated a form of mathematics than a system of simultaneous linear inequalities. Marx's would not be as crude a model as Von Neumann prescribed, but there is nothing essential in *Capital* which is not implicitly encompassed by such a general system. For this reason, the mathematical form of the ideas of each of these political economists, from Smith and Marx, through Von Neumann and his followers, produces a zero-growth model. Perhaps what we have just said on the distinctions and kinships of Marx and John Von Neumann was in the minds of Cambridge's Joan Robinson and Nicholas Kaldor, as they blended portions of Marx, John Maynard Keynes, and Von Neumann to cook a poisonous Cambridge proprietary "systems analysis" stew for export into the International Institute of Applied Systems Analysis's (IIASA) Moscow.

The crux of these connections is, that systems representable in the form of simultaneous linear inequalities describe only "zero-growth systems," or, more precisely, entropic processes. Consequently, to the degree a successful effort is maintained to regulate any physical process according to the specifications of such a mathematical system, that physical process will have imposed upon it in this way a negentropic form of degeneration. We should add the corollary observation, that even processes which are not otherwise inherently entropic will, if so controlled, either slowly degenerate in this way, if they do not abort such control by collapsing outrightly.

Under these conditions, a policy-shaping system which describes mathematically an entropic process, if used to control a society, will drive any society so controlled to entropic collapse. That is the key to the ongoing spiral of collapse of both the former Soviet and the Anglo-American systems.



Pioneers in the development of thermodynamics (left to right): Leonardo da Vinci, Christian Huyghens, and Gottfried Leibniz. "There, in those revolutionary impulses of the creative processes of mind, not in the empty space-time of algebra, lies the efficient cause for the not-entropic form of development of successful economies."

3.0 Negentropic Processes

The essential lesson which all literate persons must learn from the presently ongoing collapse of the global economy as a whole, is that whenever a physical process, such as an economic process, is efficiently regulated by ideas whose mathematical representation is entropic, the result will be a collapse of whatever process was effectively regulated in this way. Thus, we have indicated that the efficient, increasingly strict imposition of the ideas of John Locke, of Adam Smith, et al. upon more and more of the world's economy, is the leading cause for the want and chaos spreading throughout the United States and the world as a whole during the recent quarter-century.

To this effect, we have indicated already that the attempt to express the political economy of Adam Smith, Karl Marx, John Von Neumann, et al. in a form suited for administration of economic affairs, such as accounting, imposes an entropic collapse upon any economic process efficiently regulated in this way. We have emphasized that all possible mathematical descriptions of any among the British and derived dogmas in political economy, that of Marx's *Capital* included, has the in-

herently entropic characteristic more nakedly presented by Von Neumann's (zero-sum) systems of simultaneous linear inequalities. They are each and all, in fact, zero-growth models; therefore, they are each and all entropic models.

We have also indicated that, although the leading Physiocrats did recognize the possibility of a net physical profit to society as a whole, they denied that the generation of such a physical profit could be induced originally by willful human intervention.

We have indicated that real economic growth must be compared with such evolutionary models as our biosphere, or that implicit in such a view of our universe's generation of that array of elements and isotopes presented by the Periodic Table. We have stressed, that this "model" is certainly not entropic, but neither is it merely "negentropic" in the sense that the work of Ludwig Boltzmann, Norbert Wiener et al. define "negative entropy." Any consistent apologist for Boltzmann would be obliged to emphasize, more or less readily, that Boltzmann allowed the occurrence of reversed entropy only within the limits of what Von Neumann termed a "zero-sum game" for economy.

All of those British and derived models of political economy which are found in the pantheon of "Eco-

nomics 101” are dangerously absurd, in that sense that any economy efficiently regulated by them must suffer a general collapse. Emphatically, any national or global economy tightly administered on behalf of present-day “neo-conservative” ideas of “democracy and free-trade,” or of so-called “International Monetary Fund conditionalities,” is doomed to collapse into a state of economic and political disintegration, into chaos.

We have also noted, in contrast to that dismal side of the matter, that the human race has exhibited some notable successes in political economy. We have risen from a species endowed naturally with cultural potentials at the level of baboons, from a potential living population of not more than approximately 10 million, short-lived persons, to a present global potential, at present levels of existing technologies, of about 25 billion and rising. We have taken the first steps toward the feasibility of not merely exploring, but colonizing nearby space. We have increased vastly the productive power and feasible standard of living and average life-expectancy in regions of the world economy which have access to the benefits of investment in scientific and technological progress. Such evidence of long-range, quasi-evolutionary forms of upward social development of systems of political economy is what we understood during 1945-63, for example, as the kind of referent which defined modern civilized use of the term “economic growth.”

Although the causal principle of this progress cannot be represented in any existing form of generally accepted classroom mathematics, there are crucial adumbrated features of this process which, although anomalous in mathematical-physical implications, we may define more or less readily in terms which admit of representation as mathematically comprehensible forms of physical constraints. Those crucial adumbrated constraints show us that the process so reflected is absolutely not entropic. Although these constraints define an ordering which does not fit within the axiomatic assumptions underlying the so-called three laws of Clausius-Kelvin thermodynamics, that ostensibly anomalous characteristic is precisely what must be represented. That representation suffices to show that the proper descriptive term for this anomaly is not “negative entropy,” but the more modest term “not entropic.”

This anomaly does not represent a reversal of entropy, but rather a completely different ordering of the relevant processes.

This anomalous form of the process parallels the similarly anomalous forms of living processes. Thus, we may say, that as the Classical Greeks of Athens carved their geometrical way of thinking about life in Acropolis stone, and as Nicolaus of Cusa, Luca Pacioli, Leonardo da Vinci, Kepler, et al. have presented this case during the past five and a half centuries of the existence of modern science, living processes are certainly not characterized by a statistical notion of “negative entropy,” but are better described as simply “not entropic.”

Consider the following, interpolated summary of the way in which a simplified, but indicative set of such constraints is built up for statistical comparisons.

As we have indicated above, the set of constraints which shows this anomaly must be derived from an expression of mankind’s practical relationship to the universe as a whole. Obviously, since man’s relationship to the universe is currently expressed in terms of Earth’s location within our solar system, all these relations are reflected in mankind’s habitation upon the planet’s surface: per square kilometer. The functions of production and consumption, and correlated functions, of survival (reproduction) of the human race are expressed thus in per-capita values. Since the individual’s demographic existence is a function of the family household, we must reflect this, too. We have, thus: total, per capita, per household, per square kilometer.

Man’s activity on this account is represented chiefly as a correlative of *physical* production and consumption. The only forms of *services* which are closely correlated with those physical features, are education, professional medical care, science, and classical forms of the fine arts of poetry, drama, music, painting, sculpture, and architecture. However, the requirements for these forms of *services* are implicit in the cultural levels underlying sustainable successive increases in per-capita and per-square-kilometer physical productivity.

So, the indicative parameter of the reproductive relationship between the universe and mankind as a whole, is the Cantorian *type* of process represented by this view of humanity’s consumption of its own production. This kind of “input-output” relationship is the pivot for an adumbrated notion of statistically representable “function.” This undertaking is broadly analogous to squaring the circle. In the latter case, as treated by Nicolaus of Cusa, the attempted squaring provides a linear approximation of the value of π , whereas the use

of the method of exhaustion to show an absolute species-difference between the polygonal and circular perimeter forces the mind to recognize the superior ontological actuality of substituting non-algebraic *circular action* axiomatically for the naive Euclidean axiomatics of point and straight line.

The analytical key datum for defining this function, is the ironical relationship between the physical quantity of contents represented by the per-capita household or producer's market-basket and the number of labor force working-years of production per capita required to produce that per-capita market-basket of consumption. This market-basket, in turn, is correlated with the relative cultural level of physical productivity per capita, per household, and per square kilometer. The physical constraints immediately associated with these ironical input-output relationships form the keystone for building the required statistical representations.

The first approximation made to this purpose, is the definition of *productivity*.

The first term of the general function for statistical representation of productivity is: The content of the physical market-basket must be improved in quantity and quality over successive intervals, but the proportion of the per-capita working year required to produce that improved market-basket must be less than the proportion required formerly to produce the old.

The second term of the same general function, is the ratio of per-capita expenditure for producers' goods, relative to households goods must increase, without lowering the per-capita households' goods market-baskets. This reflects the necessity for increasing "capital-intensity."

The third term of that same pivotal function, is the requirement of an increase in the ratio of "free energy" to "energy of the system." For this purpose, free energy signifies the increase of total market-basket physical value produced with respect to total market-basket physical value consumed. This margin of increase is absorbed chiefly twofoldly: in expanding the scale of the physical economy, and in increasing the capital-intensity of investment in production. These gains must be expressible not only in terms of production as such, but also physical values per square kilometer, per capita, and per household.

This type of function is obviously anomalous mathematically. Nonetheless, it describes the relevant statistical appearance of those qualities of phenomena which accord with successful economic growth; also, it de-

scribes the statistical reflection of actual processes conforming to successful growth of physical economies. Although other constraints must be considered in a fuller statistical treatment, the kernel of the anomaly is situated within this set of axiomatically pivotal terms of the function as a whole. This typifies the statistical appearance of the constraints adumbrated by a "not-entropic" process.

This pivotal, core set of interlocking constraints is closely associated with central features of Leibniz's representation of a physical economy based upon the principles of heat-powered machinery. Firstly, it was Leibniz's initial objective to provide mankind with the benefits of the fact that one man, employing a heat-powered machine, could accomplish the work of 100 others not so equipped: Broadly, a "not-entropic" form of rise in productive powers of labor requires a trend of increase of both the quantity per capita and the "energy-flux density" of power supplies. Secondly, it requires a coordinate advance of the level of technology. Also, the quantity of usable qualities of water, for both personal and other essential consumption available per capita, per square kilometer, per day must increase. The ton-miles of freight moved per hour, per square kilometer, and per capita must increase, and the relative physical cost of moving a ton-mile must decrease. The relative duration, facilities for, and intensity of that type of leisure devoted to science and classical forms of fine arts must increase, to foster thus the extent and rate of development of the creative powers of the individual mind.

Within the constraints of systems analysis, for example, such a set of constraints could not be satisfied. Wherein lies the paradox?

It is the same paradox referenced by Isaac Newton, in warning the reader against the tendency of his *Principia* to paint the universe in the color of what we call "entropy" today, a universe which could not exist were God not to wind it up periodically. That is the same Newton "Clockwinder" paradox famously referenced by Leibniz in the book of Leibniz-Clarke-Newton correspondence. The fact that we can locate within a set of statistical constraints a type of result which cannot appear in systems analysis ought not to be considered surprising, unless a mathematician were committing an all-too-common elementary blunder of the positivist, the naive ontological blunder of attributing the quality of causality to the space-time gaps of an algebraic function.

The function of the mathematics of denumerable orderings is to map space-time relations, not to attribute to space-time itself the causal principle governing the physical processes situated in that space-time. If we do not make that crude ontological blunder, we are at liberty to describe statistically either entropic or not-entropic relations; if we commit that ontological blunder, we fall into the “Clockwinder” paradox of which both Newton and Leibniz spoke so famously nearly 300 years ago.

Unfortunately, to the degree mathematical training lays more or less primary emphasis upon algebraic thinking, rather than that of Gaspard Monge and Jakob Steiner’s improvements in geometrical thinking, it is much easier for the student to lose that mooring of mathematical sanity which is a constructive geometry. The student who depends too naively upon algebraic methods, may lose a developed sense that algebraic thinking, at its best, represents pictures painted in mere space-time, which is never to be mistaken for the higher domain, the real domain, of physical space-time.

I think that nothing could expose this problem, and its implied solution more clearly than the science of physical economy.

The set of interlocking constraints we have described just above, describes the form of a not-entropic process in a special choice of phase-space, that shadow of the actual process being examined. Within those chosen limitations of the description used, that is the *form* of the transformation described by the constraints. What is the *content* of the same transformation? What are those causal features of the transformation which exist outside the domain of mathematical formalism as such?

The efficient cause is the mind of man, those processes of relatively more or less developed powers of creativity which are the source of the generation, transmission, and assimilation of ideas which represent a valid, axiomatic-revolutionary transformation in previously established opinion.

By their very nature, such ideas of discovery cannot be represented mathematically, nor communicated explicitly by any form of language. Relative to any established formal system of representation, an axiomatic-revolutionary discovery is an absolute discontinuity, for which no consistent representation is possible. However, one man, the discoverer, may prompt the re-occurrence of that act of discovery in another person, by presenting effectively the paradox—the failure of

the hearer’s previously existing formal knowledge to be able to comprehend a relatively anomalous, hence, “paradoxical,” phenomenon.

This form of communication is identified as belonging to the class of metaphor. Axiomatic-revolutionary discoveries cannot be communicated within the medium of previously existing forms of a language. They can be communicated only by employing the methods of paradox to generate a metaphorical, indirect form of artistic communication, by activating within the hearer the creative mental processes which are capable of replicating the creative-mental act of axiomatic discovery being described metaphorically by the speaker.

The form of not-entropic growth of economy which we have identified here is a result of the reorganization of human productive and related practice under the influence of scientific or analogous forms of beneficial, axiomatic-revolutionary discoveries. Although it is important that we understand the development of science and fine arts from the earliest knowable portions of our species’ past, during most of the the recent six centuries of European history, until approximately 1967-74, there has occurred a general rate of growth of per-capita and per-square-kilometer productivity, beyond any precedent in the known evidence of the existence of the human species during the preceding 2 million years. This is associated with a correlated pace and intensity of revolutionary discovery in physical science and the Classical forms of fine arts beyond compare, in known preceding times.

Although there has been a generally accelerating collapse in literacy and the extent of Classical fine arts practice during the course of this century, especially during the recent 30 years, we have reached the condition that to maintain acceptable rates of progress in economy, we must devote up to 5% or more of the total employment of the labor force of leading nations to the generation and development of new technologies as such, in science and engineering.

Axiomatically, the implications of the recent centuries development of science-driven industrial society are but a continuation, albeit with qualitatively greatly intensified force, of what was always true for mankind. Nonetheless, the transformation of the required structure of the total labor force’s employment over the recent 600 years, from over 90% rural as recently as the U.S. census of 1790, to less than 2% required directly today, and the growth of increasingly capital-intensive,

energy-intensive urban manufacturing, with the latter's large science-driver requirement, has brought us to the verge of the colonization of locations within what science has redefined for us as relatively nearby space.

The margin of the population required to be employed specifically in generating both fundamental scientific and technological progress, has thus grown from the relative scale of Plato's Academy at Athens, to a number of household-members supported by science and technology which would be greater than our total population of this planet 600 years ago. We have not yet reached those required levels of such employment, but the requirement itself, approximately 10% of the world's total population, is none the less indicative of the quality of change which has occurred over the preceding six centuries.

Unless this planet collapses into a prolonged "New Dark Age" about the onset of the new century immediately awaiting us, the tasks of physical economic recovery will have obliged us to move, at an accelerating rate, in the direction of virtually a purely science-driver form of global economy. Under such conditions, it is an intelligible prospect that, within several generations, more than half of the world's labor force might be employed in developing the ever-more productive technology which the remainder of the labor force requires.

This is a transformation which began during the Fifteenth Century, centered then in Italy, around such central figures as Filippo Brunelleschi, Nicolaus of Cusa, the Paolo del Pozzo Toscanelli who constructed the map used by Christopher Columbus, Luca Pacioli, and Leonardo da Vinci. This is the outcome of the design of the industrial revolution based upon heat-powered machinery, a revolution already foreseen and designed during the Seventeenth Century by the Christian Huyghens who pioneered the piston engine using explosive fuels, and the Leibniz who shaped the development and application of the coal-fired steam engine.

There, in those revolutionary impulses of the creative processes of mind, not in the empty space-time of algebra, lies the efficient cause for the not-entropic form of development of successful economies. The constraints of that not-entropic economic process represent the preconditions which society must mobilize itself to fulfill, if that form of development is to be achieved. In effect, the form of not-entropic result defined by those constraints informs us, who must cause this to occur, that we must be willing to incur certain

relative amounts of cost for certain essentials, such as science-driver, capital-intensity, educational, health, and power-intensity elements, or fail to realize those not-entropic goals. It is not the mathematician's empty space-time, but we, with our creative powers of mind, who are the cause of not-entropic forms of economic growth.

3.1 The Politics of Growth

The political implications of the Fifteenth-century Golden Renaissance ought to be implicit for anyone who examines the prophetic quality of U.S. Treasury Secretary Alexander Hamilton's 1791 Report to the Congress *On the Subject of Manufactures*.

Leibniz cautioned that heat-powered machinery, such as the successful steam-engine designed by his collaborator Denis Papin, should be applied initially with an emphasis upon the improvement of mining. Then, the improvement of the extraction of coal in increasing amounts and cheapness appropriate to general requirements of heat-powered machinery was a precondition for the general application of heat-powered machinery. Hamilton, following Leibniz's conceptions, showed how the use of the "artificial labor" of powered machinery could be used to develop urban industries, while at the same time reducing the percentile of the population employed in agriculture, but increasing the per-hectare yield of farming above that earlier.

This transformation requires a relatively high quality of universal compulsory education of young children and adolescents. This must be a training which qualifies the young in general scientific principles, as a rigorous training in geometry grounds such capabilities, since the required character of employment will require included emphasis upon the assimilation of technologies derived from new discoveries.

If we educate the young accordingly, we produce a population which knows that all men and women possess that potential for creative reasoning which marks them, each and all, as in the living image of the Creator. Such a population will be inclined to accept, as useful to all, the practical recognition of development of relatively greater merit in some other person, but will resist the notion that inherited name or wealth constitute the members of a social class or caste morally better than themselves. The kind of world populated almost entirely by well-educated plebeans of that republican disposition is not a happy prospect for the classes of parasites whose wealth and power depend upon financial

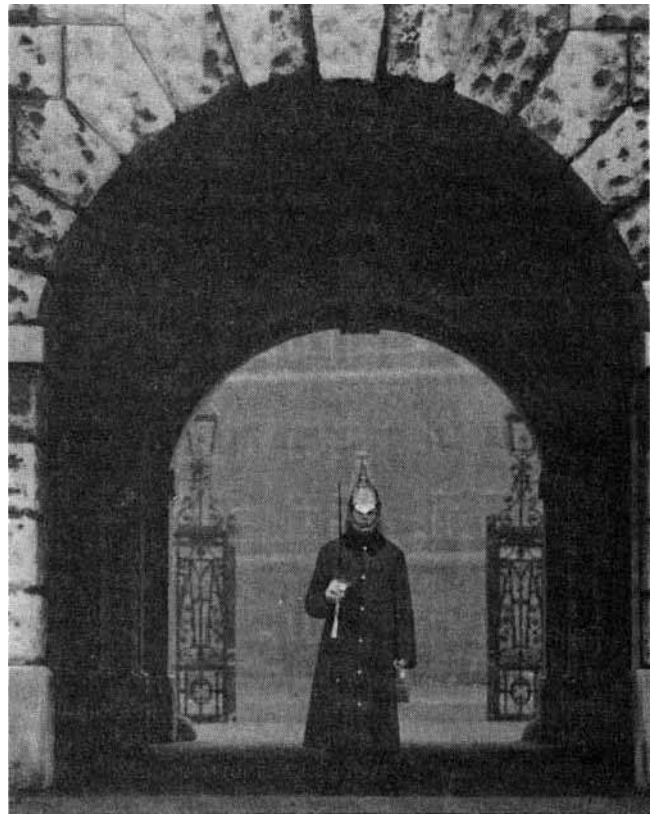
speculation and kindred forms of usury.

For the sake of Life, Liberty, and Property as empiricist John Locke defined these, the oligarchs prefer the charms of serfdom's bucolic imbecility, and a hard-working, low-paid, simple sort of general urban population. The oligarch's utopia is a world in which the young are taught desirable attitudes, but not compelled to assume their duties of any fully free and mature human being, to assume responsibility for such knowledge as classroom development of the individual's cognitive powers for geometry, Classical fine arts, and knowing also the intrinsic intelligibility of that kind of a world of work and everyday family life which is dominated by the impact of the physical sciences.

For as long as history records such matters, and as the sundry kinds of surviving shards of the archeological record confirm this for pre-historic periods, the essential, global political conflict dominating all general and individual human life, has been: Which kind of a world shall we have, the oligarch's world in which scientific and technological progress is suppressed to the purpose that the overwhelming majority of people are kept as stupefied, manipulable brutes, or a world designed to fit the requirements of individual persons in the image of the Creator?

British "free trade" dogmas were developed by the self-styled "Venetian Party" of Britain, the oligarchical party. Those dogmas were formulated at the behest of "Venetian Party" leader Shelburne beginning at the time, 1763, Britain had broken the maritime power of France. This victory allowed Britain to achieve worldwide what Venice had earlier achieved as the pivot of its imperial power throughout the Mediterranean—absolute supremacy in sea-power. During that same post-1763 period, Shelburne and his lackey Bentham launched Edward Gibbon into production of his celebrated *Rise and Fall of the Roman Empire*: Britain's Liberal Party, the formal name for the "Venetian Party," intended to establish a British worldwide empire in fact, establishing London as the global capital of a "Third Rome." As Britain's brutalization of its colonial subjects attests, Britain's global utopia was a world in which most peoples of the planet were kept ignorant, barefoot, and pregnant, but, by aid of disease and famine, not populous.

Britain has become almost a worldwide empire, even though the British Isles have become a post-industrial rust-bucket, large portions of its population reduced to the status of Yahoos, and its military power



EIRNS/Philip Ulanowsky

Standing guard at Whitehall. "As Britain's brutalization of its colonial subjects attests, Britain's global utopia was a world in which most peoples of the planet were kept ignorant, barefoot, and pregnant, but, by aid of disease and famine, not populous."

scarcely even a symbol of its former potency. It dominates the world not as a nation, a people, but through the nearly unchallenged hegemony, in all national capitals of the planet, of an empiricist's axiomatic assumptions of policy-shaping.

Today's British world-empire does not fly the Union Jack. The old red coats of uniformed tyranny are no longer visible. Today, the empire exists in the more easily managed form of a multicultural human zoo, in which each nationality or ethnic grouping thus victimized is pitted against all others in that Hobbes form of conflict which Kant termed "heteronomic." Although the special belief of the respective tribes are mutually exclusive in this sense, each and all of this multicultural array of cult-dogmas is premised upon the underlying set of empiricist axioms as all others. Thus, each nationality is a gamepiece operating according to rules of the game embedded in each and all by the British ideological gamemaster. In the same way, each is a theme-park creature in a human game-preserve for which Brit-

ish empiricism is the gamekeeper.

This same imperial function of British empiricism extends to the domain of political economy, into the fine arts, and into the domain of physical science.

From the middle of the Seventeenth Century until about 1827, the anti-Descartes, and anti-Newton factions in France represented virtually unmatched world leadership in science and in technology. From about 1827 through World War I, the standard of competence in both education and physical science was Germany. The neo-Newtonians were brought into prominence in France by order of the victors at the 1814-15 Congress of Vienna, as the leaders of France's world supremacy in science at that time, Lazare Carnot and his teacher Gaspard Monge, were expelled: Carnot was sent into exile, in Germany, and Monge was expelled, together with his program of education, from the Ecole Polytechnique which he had built. It was the power of the victors of the 1815 Vienna Congress and the British house of Welf-Hanover, which imposed anti-Leibnizian, British empiricism's ideological influences, Kantian forms of romanticist irrationalism, Hegel, and Savigny upon post-1815 Germany.

Similarly, it was Britain's participation in the victors' role at the close of World Wars I and II, as in the Congress of Vienna earlier, which has made British empiricism hegemonic in law, in political economy, and the ideology of physical science throughout most of the world today.

None of this was done to the advantage of the British population—poor wretches that most of them are today. It was done for the sake of a parasitical form of oligarchical financial system which inhabits the United Kingdom, not as a citizen, but a succubus. As we dumb-down the cattle we breed for meat and milk, so the British imperial succubus dumbs-down the breed of human victims which it breeds and exploits like mere cattle. To accomplish this, it is not sufficient merely to destroy the victims' minds with "outcome-based education"; it is also necessary to remove from the economic process that factor of technological improvement of quality of goods and of productivity of labor, which depends upon fostering the cognitive powers of the mind of child and adolescent.

So, these succubus-imperialists of the Anglo-Saxon oligarchy treat all mankind as cattle, by turning all humanity into a Giuseppe Mazzini-style, multicultural zoo, one theme-park's ideology more imbecilic than the other. What is forbidden, above all, is to teach children

and adolescents the form of scientific literacy which can be achieved only by shifting emphasis away from the schizophrenia of formal proofs to replicating in one's own mind the acts of axiomatic-revolutionary discovery of the exemplary greatest discoverers in all known history before this time. That prohibition, that state of mind comparable to the fertility of the eunuch, is what is called empiricism.

4.0 Economics as the Only Science

The preceding successive phases of this presentation have prepared us to now introduce observations which many readers will find the most shocking of all. At least, that will be a rather common initial reaction. We shall present the argument supporting the following such conclusion: *that all valid human knowledge rests upon demonstrations found empirically within the domain of physical economy.* As a first step, situate that proposition within those outlines of a *theory of knowledge (epistemology)* which are implicit in our arguments here thus far.

Thus far, we have indicated six levels of human knowledge, the five lower among which are accessible in intelligible form as human knowledge. These may be represented in the following order of ascending rank:

- 1) The lowest, nearest to bestial level: sense-perception, naive, usually irrational reaction to experience.
- 2) Formal knowledge, as cohering with the notion of judgment of experience by means of an axiomatically "hereditary principle."
- 3) Individual, valid, axiomatic-revolutionary discovery, overturning a body of formal knowledge: *hypothesis*.
- 4) An ordering-principle, or cantor *type*, generating a succession of valid hypotheses: *higher hypothesis*.
- 5) The notion of an in-some-sense orderable ranking of differing qualities of *higher hypothesis: hypothesizing the higher hypothesis*.
- 6) Implicit certainty of the existence of a higher, non-temporal order subsuming hypothesizing of the higher hypothesis, as higher hypothesis subsumes hypothesis: Plato's *The Good*, and Cantor's *absolute*.

On the premise of the argument elaborated during the preceding pages of this report, we focus attention upon a more restricted part of this epistemologist's

array, the three Platonic “levels” of hypothesizing. Now that we have listed the six levels of what might be regarded as the range of knowledge, we limit our use of the terms “knowledge,” or “human knowledge,” to signify the products of a more or less successful use of consciousness of the intelligibility of the three levels of hypothesizing.

For the case of simple *hypothesis*, the first, and simplest, of the three levels of hypothesizing, the implicit relationship to an increase in physical productivity, per capita and per square kilometer, was adequately indicated earlier here.

For the second case, *higher hypothesis*, consider one specific *type* of such a scientific method of discovery.

For this case, employ Eudoxus’ method of exhaustion, as used by Plato, Archimedes, and Cusa, among others. Reference, as a model of the use of this method in generation of hypothesis, the cases of Plato’s *Parmenides* dialogue and of Cusa’s application of Plato’s *Parmenides* paradox to solve the paradox of Archimedean quadrature. This signifies, implicitly, that every proposition to be tested for an included paradox should be reduced to its constructive-geometric form of representation, and that representation then driven, by the method of exhaustion, to beyond its limits. The existence of a geometrically defined ontological “species gap” between that function and some asymptotic boundary, at that limit, defines the relevant paradox.

Hypotheses defined by aid of employment of this method constitute a *type*, a type which corresponds to a specific way of generating a series of higher hypotheses, an *higher hypothesis*.

In geometry generally, there is another, distinct principle, also used by Plato, and by Johannes Kepler and Karl Gauss, among others. It may be used in conjunction with the method of exhaustion, but represents



Lyndon LaRouche (second from left) receives the diploma of his election in October 1993, to the International Ecological Academy of Russia. He received the diploma at the Feb. 18-21 Schiller Institute conference in Washington, D.C. It was presented by Taras Vasilievich Muranivsky (left) and Prof. Wolter Manusadjan (right), vice president and president, respectively, of the academy. LaRouche is joined by his wife, Helga Zepp-LaRouche. This article is the fuller elaboration of the speech he gave at that conference.

EIRNS/Stuart Lewis

a distinct type of generative principle. This may be described as “the quantum field principle,” as illustrated by the use of a geometrically ordered distribution of singularities by Kepler to determine the available orbits and their harmonic relations, or the seemingly “magical numbers” prompted to our attention by Dmitri Mendeleev’s discovery of the Periodic Law of chemistry.

The second is closely related to a third principle, pertaining to the differences in ordering subsumed by the distinction between positive and negative curvatures. This was stressed by Kepler, but was already treated implicitly by Plato’s “quantum field” treatment of the dodecahedron and Golden Section.

Each of these available choices of generative principles may be employed, singly, to generate the quality of ontological paradox implying an hypothesis. Also, for example, the first two might be employed in combination. The more numerous the valid such generative principles so employed, the greater the formal power of the resulting type of higher hypothesis. This comparison is an obvious choice of example of *hypothesizing the higher hypothesis*, as adumbrated for representation here.

This imagery leads us to recognition that the sole source for certainty and intelligibility within the totality of human knowledge is a view of physical economy which corresponds to such notions of hypothesizing. This is the epistemological consideration which implicitly underlies a competent science of physical economy.

As Genesis I specifies man's given power and corresponding responsibility to be the master of this temporal universe, so mankind must measure its relationship to that universe.

This injunction of Genesis I is proven to be no unintelligible command, as if to be carried out in blind faith by the obedient.

It is a fully intelligible instruction, thus a knowable truth fully binding professed heathens, too. This certainty is imposed upon all rational persons, as we are able to demonstrate absolutely the manner in which individual man's power of creative reason sets mankind apart from and above all other existences within this temporal universe. It is therefore the intelligible principle which Gottfried Leibniz recognized as *natural law*. This is the basis for the lawful authority of a universal morality, as even the professed heathen must recognize this to be the case.

As man must give an accounting for the behavior both of his species and of himself individually, so must we constantly judge our society, and ourselves, in every facet of our activity and existence. This, reason instructs us that we must do according to such implicit, and specific requirements of universal natural law.

That use of the term "accountability" may be seen as interchangeable with the properly defined term "knowledge." That signifies *knowledge of mankind's relationship to the temporal universe*. That also signifies, for each of us, our individual relationship to the process of influencing the relationship to this universe of our nation as a whole, of mankind as a whole. That means, that there can be no true knowledge without such a sense of accountability for mankind as a whole, as that sense is imparted to us by the power of creative reason.

That means, therefore, *knowledge of hypothesis*. That means, therefore, *knowledge of hypothesizing*. That means, therefore, *knowledge of hypothesizing the higher hypothesis*. That requires, therefore, knowledge of some yardstick, by means of which principle of ranking the internal ordering of the process of hypothesizing the higher hypothesis may be rendered efficiently, morally intelligible.

Example: Today's Global Crisis

Up to the point of this concluding section of the report, we have emphasized the approach by means of which the correlation between scientific progress and increase of mankind's standard of living and potential population density may be rendered efficiently intelligible for guiding education and other indispensable policy-shaping practices. We have situated that aspect of the subject-matter, physical economy, in respect to a presently ongoing, global collapse, a seemingly unstoppable collapse into a looming void of global "new barbarism," a void which is the extinction of all civilization as we have known it.

Let us underscore a few, perhaps pedagogically indispensable, illustrative points from among this crisis's painfully embarrassing personal implications for many ordinary citizens of various nations.

That looming smell of something akin to Apocalypse does not permit us to limit blame for the world's presently worsening misery to accusing a relative handful of politicians, or some analogous scapegoat. The problems before us are not the result of "mistakes"; the failure of policy-shaping which presently grips the entire planet is of a systemic, global, and axiomatic quality. The evidence presented by this crisis, is that the human race, virtually in its entirety, has failed; the existing body of generally accepted public opinion, in all nations, at every level of society, and of virtually all persons, has caused this present crisis.

The fact that we might attribute "blame," in the sense that we can show how this matrix of pathological opinion came to rule virtually all of this planet, top-down, does not permit the use of the term "innocent by virtue of ignorance" to excuse the unwitting citizen. That citizen may indeed have adopted destructive forms of popular, and populist opinion out of blind ignorance and pathetic suggestibility; but, his support, even his mere toleration of such dogma, has contributed to allowing the crime against all humanity which those beliefs have brought about.

If one is driving an automobile to destruction under the influence of intoxicants, one gains no escape from the laws of nature by pleading momentary ignorance. If one chooses to believe that "free trade" is the naturally superior policy of all humanity, and millions of people in some foreign country die of hunger and disease because of the imposition of "free trade" upon that region of the world, you who support that idea have guilty complicity in the suffering and death of those millions.

That person is fully as guilty personally as the drunken driver who kills a pedestrian.

The intended thrust and relevance of this argument is the following. If a catastrophe to society is brought about by the deliberations of a few, using principles unknown, or not tolerated by, the majority of the society, then the error of opinion which must be corrected should be designated accordingly. However, if the disaster is caused by application of beliefs which have been generally supported, or even merely tolerated by, the majority of adult opinion, then the majority of that nation is to be blamed. We must say, under such a circumstance, that the condition cannot be cured without exposing the criminal disposition inhering in the relevant aspects of the prevailing public opinion of that nation's majority. So, today, for example, everyone who supports those immoral ideas called "free trade" is guiltily complicit in respect to the ongoing destruction of civilization as a whole.

That illustrates in part what we signify by our use of the term "systemic."

Those of us who stand as candidates for election, or have visible claims to expertise of some sort or another, are constantly confronted with the question: "What is your alternative?" respecting this or that proposed or existing policy. In respect to the effects of today's "free trade" dogmas, my own answer to a demand that I politely propose "alternatives," rather than denounce, is: "When you make the demand, 'What is my alternative?' I tell you that you are being dishonest; you are evading the implications of the issue which you find morally demanding upon yourself. If I see a man sexually abusing a child in the street, and someone asks me, 'What alternative do you have to suggest to that man?' I would react in the same way as I do to the evasiveness of your diversionary question now." When a murderous or suicidal policy is axiomatically wrong, it is immoral to demand any alternative to promptly defying, uprooting, and destroying that axiom of belief.

For example, the evasive question: "Destroy 'free trade'? What, then?" In the case of the United States, for example, the mere elimination of "free trade" means a "relapse" into the wonderfully successful "protectionist," anti-John Locke, anti-Adam Smith, Leibnizian principles reflected in Article I of the U.S. Constitution, and U.S. Treasury Secretary Alexander Hamilton's, and also Friedrich List's explication of those principles. One does not require a documentary proposal of new alternatives to remove a fish-bone from the throat.

Whence comes the global influence of those ideas which are responsible for the self-destruction which threatens imminently all nations and peoples, including the United States, today? To this point, it could be proven beyond intelligent rebuttal, that the spread of the ideas of John Locke, through the political victories of the British Empire since 1763, has established the selection of those popularized ideas whose influence is responsible for the ongoing global collapse today. This includes, as examples of that phenomenon of influence, former British colonies, which have established their nominal political freedom, but which administer their own nations "quite independently" under the influence of ideas premised axiomatically upon the multicultural principles of British empiricism.

Yet, halt there for a moment. Look at that post-industrial rust-bucket which is today's post-Harold Wilson, post-Margaret Thatcher Britain. With that set of facts before one's eyes, could anyone be so naive as to insist that the ruin of the world has been conducted to the advantage of the Celtic-Anglo-Saxon population of the United Kingdom, the ordinary British person's ingathering of Locke's Life, Liberty, and Property? Yes, the hallmark of the global self-destruction in progress is the spread of the influence of British empiricism into places which include India, Argentina, Nigeria, Brazil, and the United States today. It must also be emphasized, as well as merely granted, that this spread of empiricism came through such signal events as London's participation in the victories of 1763, the London-directed Jacobin Terror in France, the 1814 Congress of Vienna, Britain's use of the Russian revolution of 1905 to defeat the policies of Count Sergei Witte, its use of its protégé Adolf Hitler to overthrow the 1933 Kurt von Schleicher government of Germany, and Britain's geopolitical wars against threatened economic cooperation in northern Eurasia, World Wars I and II. That is all true and useful information, but it does not address, and might be misused to divert attention from, the underlying issue posed by the present, systemic global crisis.

The British Empire was not some autochthonous development thrown up by the ranks of the people of England, Wales, Scotland, and Ireland. It was imposed from abroad, by the most powerful force in the Mediterranean of the time, the world-capital of slavery and usury, Venice. During the period from 1582 onwards, London, like Rotterdam, was taken over by the neo-Aristotelianism of Padua, the cultish, hesychastic "spiritualism" of Gasparo Contarini's circles, and the family

financier trusts of Venice's *Giovani* faction. These Venetians around the notorious Paolo Sarpi came like a Hollywood filmmaker's "body-snatchers," to take the souls of Englishmen and turn some among them into privileged replicas of Venetian oligarchs. The ideas of these Venetians were essentially a continuation of the pagan Roman pantheon, of the former Greek and Hellenistic center of Mediterranean usury and kookery, the Delphi cult of Apollo, and of the evil usurers and slave-traders of Baal and Moloch before that.

The issue here ought to be more or less readily intelligible. It is not the exertion of physical force by men which rules mankind. Mankind is ruled by the force of ideas, by the interplay of those contending ideas which, acting through the minds of men, thus control the physical conduct of society.

Biologically, there are no intrinsically good or intrinsically bad nationalities; the term "race" is essentially a meaningless one, which would mean nothing but for the regrettably persisting lunacy of belief in race by some deranged creatures. The human race is made up of nothing but individuals who share in common that spark of creative reason which defines all persons as in the image of the Creator. There are only good versus bad ideas; there are some very evil axioms of belief proliferating around this planet still, including bad ideas whose germ is as old as Shakti, Ishtar, Baal, Dionysius, and the old whore Gaia's Apollo Cult of Delphi.

The Venetian "body-snatchers" conquered the general opinion of numerous British institutions, spreading those anti-Renaissance ideas known as empiricism, usury, magic, and racism. This was the foundation for the ideas of such later British radicals as Adam Smith, Jeremy Bentham, John Stuart Mill, John Ruskin, Aleister Crowley, Bertrand Russell, and H.G. Wells, and John Rawlings Rees's London Tavistock Clinic. The now-departed imperial institutions which formerly flew the Union Jack were temporarily the vehicle through which the generally accepted authority of these ideas was spread. The acceptance included, today, the majority of the establishments and textbooks of most nations of this planet.

Those times have passed. Today, Britain's elite has collapsed like old Sodom and Gomorrah. The Nineteenth-century Britain has become an inglorious rubble, a shrunken, pathetically mewling relic of its departed imperial past. The trouble is, the disease spread by that departed empire has a cancerous life of its own. The grip of those entropic Venetian ideas upon the decision-

making of governments and international institutions has efficiently ensured that the decisions carried into practice are, at least predominantly, a force for destruction of civilization as a whole.

Example: Today's Official Lies

The evidence of global physical-economic collapse, which we identified in the beginning of this report, is indisputable statistically, and is evident to any mature citizen who compares the bill of consumption of 25 years ago, and the photographs of places from that time, with the corresponding evidence from today. New York City, for example. Yet, we hear repeatedly of recoveries which in fact never occurred; the only evidence which might appear to corroborate those glowing reassurances is the cancerous growth of purely speculative forms of financial liabilities.

The correlated feature of this same recent history, is the record and results of successive, post-1965 changes in policies. Of this one might say, "The more things change, the more they remain the same." Things become worse. The problem is acknowledged, and a reform is promised. A reform is then made. Things become worse. Worse, and then worse, and then worse: So it has gone, from reform, to reform, to reform, for most of the world, for about 30 years. The problem does not lie with any one policy, but with the axiomatic assumptions which underlie the way in which successive reforms in policy are made. The banner upon which such U.S. reforms, always for the worse, have been made, is emblazoned, "Democracy and Free Trade."

Examine briefly the fraudulent way in which the word "democracy" has been employed. For this purpose, focus for a moment on the turning-point in the Civil Rights campaigns of the 1960s.

Until the Rev. Martin Luther King was assassinated, the Civil Rights movement was moving to re-establish those notions of *legal right under natural law* which were engraved in the plain intent of the 1776 Declaration of Independence and 1789 Federal Constitution. If an African-American were denied such rights, then that right did not really exist as a right for anyone; if, on the contrary, anything which African-Americans won as a right, became thus re-established in fact as a right for every person. Then, "bang"; it ended. Immediately, that Spring of 1968, the Ford Foundation of McGeorge Bundy and Dr. Kenneth Clark intervened at Columbia University campus, and elsewhere, to mummify the Civil Rights movement, and replace integration with a

new guise for old “Jim Crow,” a program of recruitment to an African-American “theme park” in an all-American multi-cultural human zoo.

In Britain, the Labour Party provided socialized medicine, until the private competition was no longer an available alternative, and then the trap was closed upon the victims who had formerly thought themselves beneficiaries. I have no reason to doubt the sincerity of President Lyndon Johnson’s support for civil rights; he sponsored a ticket on the train of progress for all Americans, African-Americans included. What happened after Dr. King was assassinated? They went to the ticket-window, they took their tickets, they boarded the train, they found seats awaiting them; but, the train never moved. The railway line had just been closed down by the authors of the newly introduced “post-industrial utopia.” Outside that train gathering dust, were the recruiters for the Ford Foundation’s segregated, all-African-American theme park, offering recreational drugs to lessen the pain.

That is what the word “democracy” has come to signify in the mouths of the propagandists for “Project Democracy.” “Free trade” meant, since 1978, deregulation of transportation, deregulation of banking, and, after 1982, deregulation of those who loot public and private pension funds with “junk bonds.”

Those are sufficient illustration of the point to be made. In each case, and the almost limitless number of analogous ones which could have been listed, the problem is located not in the fallacies of a particular law, or other form of policy. The problem is located in the generative assumptions *underlying* each of a succession of policy-reforms; the problem lies in the “hereditary principle” of presently accepted modes of policymaking.

In each case of this type, statistical reporting on the state of the economy, or others, the fault in the standard of measurement for analysis, and the flaws in the type of policy-shaping employed to design reforms, are usually coordinated in character. In economy, as in the example referenced, the flaw is often to substitute nominal values, such as notional valuations of capital in monetary terms, which is a most common cause of statistical hoaxes. Related kinds of axiomatic fallacies are the general rule for most cases.

Any case of this sort may reflect one, or a combination of two, types of fallacy in the policy-shaping assumptions used. Either the axiomatics are disastrously wrong from the beginning, as is true for “free trade,” or

a limit has been reached, in which region what was tolerably successful under earlier conditions is no longer tolerable. In these kinds of cases, there is some useful resemblance to the notion of Platonic higher hypothesis, at least in the negative sense. It is the generative principle of faulty policy-shaping which must be altered, axiomatically. Unless that is done, attempts at reform will proceed in no direction but from worse to still worse. The solution is to apply the principle of higher hypothesis.

4.1 Economics and Higher Hypothesis

The increase of mankind’s potential population-density is the yardstick to be applied to control the choice of higher hypothesis. For our purposes here, we may approximate “potential population-density” by increases in the physical-economic productive powers of labor, per capita, per household, and per square kilometer. We include implicitly in this education, medical care, scientific research, and engineering services to production, physical distribution, and basic economic infrastructure. This does not include all aspects of required consumption and productivity, but it includes most of the total, and is the most characteristic content of increase of potential population-density generally.

The implied proposition is, that increase of potential population-density, as I have defined it, is in some way a basis for proof of a type of higher hypothesis. Since so-called “fundamental,” or, better said, axiomatic-revolutionary discoveries in physical science are the most typical source of increase of the physical productive powers of labor, it is also an implied proposition, that increase of potential population-density provides the metrical standard for judging choice of scientific method. Perhaps this appears an extremely radical claim; put that to one side for the moment. Examine the salient implication of the implications stated thus far.

The spectacle of the hair rising upon the napes of some necks among the science professionals reflects the stubbornness of the widely held, but exaggerated belief among most mathematicians, that proof is mathematical in nature, at least in respect to form. This belief is tolerable as long as the propositions examined in this way are limited in type to those consistent with the “hereditary” axiomatic implications of the form of mathematical representation employed. Once an axiomatic-revolutionary proposition is put on the table, the ordinary sort of mathematical proof becomes axiomatic-

cally an absurdity; proof of this is identified above.

Although it is presently the conventional view that we must rely upon “inductive” generalizations from formal proofs, once we acknowledge the implications of axiomatic-revolutionary forms of discovery, the fallacy of inductive formalism should be promptly apparent. In the latter case, we must treat the act of discovery itself, formally a “mathematical discontinuity” terminating the competence of the “hereditary principle,” as the primary datum.

The latter requirement is not mysterious, provided one has been educated in agreement with the Classical Christian humanist tradition of Gerard Groote’s Brothers of the Common Life. As I have been obliged frequently to reference this matter: Such a Classical education rejects the textbook methods for those of replicating the act of discovery reported by original (or proximate) sources. The effect of this method is to accumulate knowledge in the student’s mind, each discovery in the form of its replication, as a reliving of the original act, by that student. That student is familiar with the reality of hypothesis, in that way. These moments from some of the greatest minds in all prior history live, as glimpses of the original discoverer’s innermost personality, within the mind of the student. Thus, the notion of a principle of discovery is readily accessible to a student who has been educated in this way.

From this standpoint of reference, one can trace readily the nature of the causal sequence linking an original axiomatic-revolutionary discovery to its efficient consequences as increase of the physical productive powers of labor.

Once a discovery has been effected, its efficiency must be demonstrated in what is loosely termed often as “a crucial way,” according to strict notions of design of experiment. This was described, among other locations, in the current *Fidelio* (Spring 1994) report on my 1948-52 discoveries in physical economy. The refined crucial experiment serves as a model of reference for introducing a new technology as an included principle of machine-tool design or analogous applications. The transmission of the physical expression of a discovery, in this way, together with the cognitive principle involved, is the source of increases of the physical productivity of labor—per capita, per household, and per square kilometer.

As indicated, a continuation of this process generates a not-entropic form of increase of the ostensible ratio of “free energy” to “energy of the system,” as

measured in per-capita, etc. terms. This includes the previously stated qualification, that the ratio of producers’ goods production to households’ goods production increases, although the physical quantity and quality of households’ goods consumption, per capita and per household, is increasing, while the per-capita social cost of producing the market-basket is declining. It is this not-entropic form of ordering principle, taken together with its practical implications, which serves as a good approximation of increases in relative potential population-density.

It is the impact of a principle of discovery upon such a desired not-entropic result which is the demonstration of the validity of that form of higher hypothesis. In the corresponding fashion, this is also the referent for hypothesizing the higher hypothesis.

Restated: This view is measuring, so to speak, the relationship between mankind and the universe. This is made in the only way possible; the practical question to be answered, is *whether there is greater or lesser correspondence between the intended production of the preconditions for successful reproduction of the human race, and the laws of the universe which govern the results of those attempts?* The answer to this question is not to be found in fixed ideas, not in ideas premised formally upon a fixed set of axioms, but only in some principle of change of such ideas, from a lesser to greater degree of efficient correspondence with the lawful ordering of our universe. This desired correspondence, through such change, must plainly be measured in no other terms than relative potential population-density.

This is a question to be resolved by resort to some generally accepted classroom mathematics. This is the means by which to discover what is a relatively better or inferior form of mathematics, as the geometric comparison of the algebraic, non-algebraic, and transfinite types of mathematics exemplifies such variety.

In this sense, and no other, the standpoint of physical economy is the fundamental premise for physical-scientific, and also artistic, knowledge. Knowledge itself is man’s conscious examination of mankind’s conscious powers for generating valid axiomatic-revolutionary hypotheses, for accomplishing that by aid of discovery of a scientific method of successive discoveries, called an higher hypothesis, and for improvements in the quality of such a scientific method, called hypothesizing the higher hypothesis. This is claimed, and nothing more.