

‘Fair Trade’ As A Phase-Shift

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A man standing, despondent, in a line of old horses at the gate of the a slaughter-house, was told by the wise old horse behind him, “I warned you where your insisting on ‘horse-sense’ would get you!” When you speak or write of “common sense,” be certain you make clear that you are referring to a form of thinking specific to sane human beings. When in doubt, say “common *human* sense”! That may explain what happened to the nervous columnist George Will, when President George W. Bush announced the new steel tariff.¹

Today’s typically incompetent professor of economics, such as Enron Wendy’s Senator Phil Gramm, or Arthur Burns’ Milton Friedman, confuses the study and practice of economics with a poor fool’s statistics, or simply insists, as Gramm does, that there are no principles of economics which can not be discussed and agreed upon among any group of lame-brained populists who had just happened to wander into his kitchen at that moment. What President Bush did, with the announcement of the “fair trade” tariff, greatly upsets them. Someone should have warned the addled devotees of Gramm, Friedman, and Will, that, whereas some horses are rumored to be able to count, human beings are expected to think.

Tell that to today’s universities! Today’s typical university classrooms would bring a blush to the cheeks of even those pedants described in Gulliver’s Travels to Laputa. Most departments pride themselves in their lack of responsibility to, or for, the content of what is being taught as different specialities than their own.² Most among the academic economists, for example, are proud of knowing nothing about how products are produced; most of them rely defiantly on the same *post hoc ergo propter hoc* variety of gambler’s statistics, which Cambridge University’s

1. George Will, “Bending for Steel,” *Washington Post*, March 7, 2002.

2. Cf. C.P. Snow, *Two Cultures and the Scientific Revolution* (London and New York: Cambridge University Press, 1993 reprint).



"It is time to dump that myth of 'free trade,' which has done so much to ruin us," LaRouche writes. "Instead, we must teach, study, and apply some competent economic science. I say once again: we have lately arrived at that point, that unless we make this change in policy-making practice, this crisis-stricken republic of ours will now soon vanish from the planet." Shown here, shipping in the Port of Houston.

Joan Robinson associated with bumbling Milton Friedman. They love a gambler's numbers, but abhor the honest labor of physical science.

Instead of the principles of physical science, virtually all departments of the university, even what are ostensibly physical-science programs, rely implicitly upon the student's earlier conditioning in those simple, "ivory tower" notions of space and time taught in the very poorest quality of geometry and algebra classes. They insist that there is almost nothing in the universe which can not be neatly explained away, at the blackboard, by aid of a childish set of Euclidean, or quasi-Euclidean definitions, axioms, and postulates.

An essential part of the relative popularity of those real-life imitations of Laputan professors, is that they teach only precepts which science-illiterates could readily accept, and appear to understand, but all that without subjecting the students to the painful experience of being obliged to abandon any part of today's prevalent, populist's style in illiteracy. Thus, many among those miseducated populists who became victims of the "new economy" swindle, had said, in defense of their credulity, "But, I understand what they are saying." Such credulous prey of the quackademics know essentially nothing about a matter on which their nation's survival might depend; many of those gulls are, still today, proud of themselves for what they have been duped into believing.

The recently reported, scandalous behavior of some leading accounting firms, and close scrutiny of the fraudulent economic reports issued by sundry governmental and putatively prestigious private reporting agencies, typifies the al-

most brutish functional illiteracy of even so-called leading layers of public and private life. The popular credulity for the blatant frauds headlining the principal output of mass media reporting in general, typifies the pathetic state of belief of our population in general, especially among secondary and university students from among the recent two generations of our population. Most among those generations, both adults and adolescents, have often appeared unable even to remember that a report contrary to today's was not only featured in yesterday's headlines and editorial columns, but are believed, out of blind faith in George Orwell's "Big Brother," by most among today's new batch of true believers!

Today, most of these unfortunates do not rely on even old-fashioned school-book forms of Euclidean geometry. They prefer the lunatic "new math." Therefore, given the mind-numbing effects of "programmed learning," do not be surprised that society generally tolerates the carnival side-show economics of the like of Gramm and Friedman, or that emotionally fragile George Will is driven almost to the gates of Peter Weiss's Charenton, by his panicked reaction to President Bush's announcement.

To conduct a sensible discussion of any really important topic of economy, such as the causes of today's global monetary-financial crisis, it is indispensable to lead the relevant sector of the population to the kind of understanding of geometry which Carl Gauss and Bernhard Riemann typify. This requires some thinking, which, admittedly, ranks in today's university-educated circles, way down the ladder from such popular academic attention-getters as professional football,



“Although President Bush has taken one important step away from the preceding decades commitment to ‘free trade,’ that does not mean that Bush’s Presidency really understands what it is doing.” Here, President Bush with Treasury Secretary Paul O’Neill.

Nintendo games, and ladies’ mud-wrestling. Take the issue I have identified at the outset here, as something which is to be best understood as an example of such a scientific problem in geometry. The proper question to be asked, is, therefore: What is the effect, from the standpoint of physical geometry, on every part of an economy, of a shift from a “free trade” to a “fair trade” policy, and vice versa?

This takes us now, out of the fragile-fantasy world of George Will, into areas of common *human* sense. To understand the shift from a “free trade” economy, such as today’s, to a “fair trade” economy, requires attention to two crucial principles of economics which, unfortunately, very few of today’s professed economists even begin to understand. These two issues are: how is a profit really generated in an economy considered as a whole; and, given the way the profitability of an economy as a whole is actually determined, how can a shift from “free trade” to “fair trade,” transform a sick economy, like that of the U.S. today, into a healthy one?

Although President Bush has taken one important step away from the preceding decades commitment to “free trade,” that does not mean that Bush’s Presidency really understands what it is doing. It has reacted to the fact that without returning to traditionally American protectionist policies, this nation could not possibly muster the economic sinews required to support the Bush administration’s current, aggressive military policy. Nonetheless, Daschle, Bush, et al., have moved in the right direction in taking this first step toward a “fair trade” policy, whether either understood the deeper implications of that, or not.

The Bush Administration’s current approach to a wished-for recovery of the U.S. economy, will inevitably fail. It may have lured itself into the wishful belief, that its approach to

so-called “stimulus packages” will replicate the success of Franklin Roosevelt’s and Presidents Truman’s, Eisenhower’s, and Kennedy’s military-linked stimulus programs. Pumping money into the pockets of those wealthy campaign-contributors with holdings of military relevance, will not prompt a recovery under presently prevalent conditions of the economies and financial markets.

Any successful effort would require an immediate scrapping of all those pro-monetarist revisions in policy instituted, cumulatively since 1966-1967, especially the floating-exchange-rate system and massive deregulation unleashed by what are most fairly described as the Kissinger-Brzezinski administrations of 1969-1981, eliminating the policies enforced under the tyrannies of Federal Reserve Chairmen Paul Volcker and Alan Greenspan, from October 1979 to the present date.

The step toward “fair trade,” away from “free trade,” is a step in the right direction, but before stepping too far in that direction, it will be necessary to build the relevant bridge across the relevant, waiting chasm.

Our citizens must understand those deeper implications, if we are to free the nation’s policy-making from the confused state of mind typified by the case of columnist Will.

1. How a Real Long-Term Profit Is Generated

The first principle which ought to be taught in any course in economics today, is that there is no agreement between the popularized fad called “ecology,” and real-life economics.

In modern society, economics begins, where ecology fails. Lower forms of life appear to practice ecology; only human beings, at least the sane ones, are capable of practicing economics, instead. To understand these connections, we must start by concentrating on the real, *physical* side of the economy, rather than the superficial, secondary aspect, the financial side.

In the process, the reader must, unlike retiring Senator Phil Gramm, consider some crucially important technical terminology, and also some previously unfamiliar, but relevant historical facts, as in any serious investigations.

The difference between the student who walked out of Milton Friedman's or Phil Gramm's class, in disgust, and the poor fool who stayed behind in that course, is just what the wise old horse explained to the doomed poor fellow standing in front of him. All economics is based on the individual human being's ability to discover, or rediscover *an experimentally validatable universal physical principle*, a discovery which no lower form of life, or, apparently, Friedman or Gramm, could ever make.

By "physical economy," we should mean, in technical language, the measurement of *the rate of increase of mankind's potential relative population-density, per capita and per square kilometer*. This measurement is made possible through the discovery and application of those methods used to make any valid discovery of a universal physical principle. These discoveries can not be made by alternative methods, such as deduction, nor by any mere sense-perceptual view of phenomena as such.

This principle of economics has always been implicitly characteristic of human existence, whenever and wherever human beings existed. Admittedly, when competent economists study forms of society existing prior to modern times, as they should, they should be able to measure those societies' performance by comparison with the methods used to study modern economies. However, contrary to the myths of those academics known as reductionists, an actual science of economics is an historically specific outgrowth of modern European society's development, beginning the Fifteenth-Century, Italy-centered Golden Renaissance.

The policies introduced, under the influence of that Renaissance, by France's Louis XI and England's Henry VII, are the earliest notable examples of a commitment to modern economy by a sovereign nation-state. Progress in approximating the policies of a modern economy, was made by such influential Sixteenth-Century figures as France's Jean Bodin and England's Thomas Gresham. However, a systematic notion of economic science, could not have existed prior to the later, powerful discoveries of the first approximation of a comprehensive mathematical physics, by Johannes Kepler.

The possibility of a general science of physical economy, depends upon the impact of Kepler's original discovery of a universal principle of gravitation, published in 1609. It depends, especially, upon the method he describes in that book,

the method by which that discovery was made.³ This method has been the foundation of any competent form of comprehensive mathematical physics. It is the method which is the foundation for the actual discovery of the principles of modern economy, beginning with the relevant 1671-1716 work on this matter by Gottfried Leibniz.

The crucial importance of Kepler, and of the work of Fermat after him, for the founding of a competent approach to economic science, lies in the method which Kepler employed to define the standard by which all competent forms of physical science since, have defined as the meaning of an experimentally validated universal physical principle. Without the mastery of Plato's Socratic method, which Kepler adopted from his identified predecessors Nicolaus of Cusa, Luca Pacioli, and Leonardo da Vinci, it is impossible to define a competent approach to investigating the principled features of a modern economic process.

No economy can be understood from the financial side alone. We must understand the principles of physical economy, first; after that has been accomplished, competent study of the financial side of the economic process can begin.

Unfortunately, education today, including so-called higher education in general, is usually much poorer in average quality than it was a generation ago, and that was already poorer than the preceding generation's. Today's typical forms of instruction in mathematics and physical science, as usually doled out to secondary and university classrooms and textbooks, afford the student no insight at all into the very foundations on which all great accomplishments in physical science in general, and economics in particular, have depended since the beginning of modern European civilization. In today's academic world, such are among the largely forgotten accomplishments, on which modern civilization depended, which were revived by that revolutionary rediscovery of the pre-Roman, Platonic scientific method, which erupted in Fifteenth-Century Italy.

Fermat's principle of "quickest time," is among the most crucial continuations of Kepler's refutation of the common fallacies of method, by Claudius Ptolemy, Copernicus, and Brahe (and also Sarpi's lackey Galileo). This work of Kepler, Fermat, et al., provided the platform on which such collaborators as Christiaan Huyghens, Gottfried Leibniz, and Jean Bernouilli laid the Seventeenth-Century foundations for the only competent form of modern methods of experimental physical science. This was also the foundation for Leibniz's discovery of the elementary principles of physical economy. This element in the work of Leibniz, was the source from which all competent economic science and related statecraft, such as

3. Johannes Kepler, *The New Astronomy*, William H. Donahue, trans. (New York: Cambridge University Press, 1992), or, for the earlier sources customarily referenced by the present writer and his collaborators since the 1970s, chiefly the *Neue Astronomie*, Max Caspar, trans. (Munich: Verlag R. Oldenbourg, 1929), and *Weltharmonik*, Max Caspar, trans. (Munich: Verlag R. Oldenbourg, 1982, reprint of 1939 edition).

that known to Benjamin Franklin and Alexander Hamilton, was derived thereafter.

As I have shown in many locations published during the recent thirty-odd years, *all competent national economic policies are formulated on the basis of actual, or implied long-range economic forecasts*. Such policy-shaping must address questions of the type: What will be the comparative total effect on the nation's *physical* economy, five, ten, twenty-five, and fifty years down the line, respectively, of choosing each among an array of suggested policies today? Making relevant laws and budgets without competent long-range economic forecasting, reminds us of the fisherman who spent a lifetime stubbornly casting, but without bothering to discover whether or not he was fishing in a dry hole. To develop a scientific approach to long-range forecasting for national economies, it is indispensable: *to define precisely what a universal physical principle is; by what means such principles are discovered and developed; and by what means cooperation to bring about their successful application, is to be organized*.

For example, it was through the influence of Leibniz, as an opponent of John Locke, upon the leading intellectual life of the Eighteenth-Century English colonies in North America, that a process was set in motion, with European allies of the American cause, to establish the most successful form of modern nation-state economy yet devised, the U.S. Federal Constitutional republic founded in 1789. This was the nation rescued from its subsequently threatened destruction by the intervention of John Quincy Adams' follower, and, earlier, one-time crucial collaborator, President Abraham Lincoln.

Unfortunately, our nation's national economic practice has often violated the constitutional principles upon which the republic was founded. This has been, once again, the unfortunate trend during the recent thirty-five years. Similar deviations from those principles, always with awful results, have occurred during earlier periods.

From its beginning in 1789, our new-founded constitutional republic was repeatedly in jeopardy, since the blow against freedom struck by the July 14, 1789 British plot known as the storming of the Paris Bastille, an event whose outcome was to transform our stoutest ally, France, into an important enemy.⁴ Despite that, the recurring insurgencies of

the American patriotic intellectual tradition, such as that of Abraham Lincoln and Franklin Roosevelt, have repeatedly brought forth the American economic model from the places it had been held captive by foreign adversaries and their domestic accomplices, such as van Buren, Polk, Pierce, Buchanan, Cleveland, Theodore Roosevelt, Woodrow Wilson, and Calvin Coolidge. The adversaries included the British monarchy and, excepting the Emperor Joseph II, both the Spanish and Austrian Habsburgs, in addition to the implicitly treasonous, so-called "American Tory" tradition.⁵

Recently, it has been chiefly the continuing legacies of Presidents Nixon and Carter, and their "Leporellos" Kissinger and Brzezinski, which have pushed our republic to the present brink of catastrophe. The world, and the U.S.A. itself, have now arrived at the point in history, at which we, either, once more liberate that previously ensnared American patriotic intellectual tradition, or, under the present, exceptionally extraordinary circumstances of ruin, this nation, and perhaps most of the planet, too, will be plunged into a prolonged dark age, a world desperately hoping for a reappearance of even simply human conditions.

We are in a situation, now being faced by President Bush, in which the past thirty-five years' trends in economic policy-shaping have failed disastrously. In this situation, a return to economic policies consistent with the American intellectual tradition of Benjamin Franklin, Alexander Hamilton, Mathew Carey, John Quincy Adams, Henry Clay, Henry C. Carey, and Franklin Roosevelt, are indispensable for the survival of our nation. Moreover, it is likely that only the role of that same American intellectual tradition, as a catalytic factor of leadership in producing new forms of international cooperation, could prevent what is already a looming global catastrophe for civilization as a whole.

It is time to retire the widely practiced "Brand X" economics commonly taught in universities. It is time to dump that myth of "free trade," which has done so much to ruin us. Instead, we must teach, study, and apply some competent economic science. I say once again: we have lately arrived at

4. The storming of the Bastille, on July 14, 1789, was organized by the British agents the Duke of Orléans ("Philippe Égalité") and Jacques Necker. That event was conducted by the Duke as a campaign rally on behalf of Necker's appointment as Prime Minister of France. Its larger purpose was to block the adoption of the proposed new French Constitution presented by Lafayette and Bailly. Although Lafayette and Bailly submitted to the conditions created by the actions of Orléans and Necker, the spiral of decay in the French political system continued through the executions of the Jacobin tyrants Robespierre, Saint-Just, et al. In August 1792, Lafayette was imprisoned in a dungeon at Olmütz by the Austrian Chancellor; according to the account dramatized in Beethoven's *Fidelio*, on orders from British Prime Minister Pitt ("Pizzaro"). The opponents of Lafayette and Bailly (Orléans, Robespierre, et

al.) had been adversaries of Benjamin Franklin; Necker had been, together with Lord Shelburne's historian Gibbon, personally a member of the circles of the British East India Company's Shelburne; Danton and Marat were personally agents of the Secret Committee of the British Foreign Office, then headed by the Jeremy Bentham later exposed as the controller of U.S. Vice-President and Bank of Manhattan founder Aaron Burr. Napoleon Bonaparte, the first modern fascist ruler, and his circles, including the fascist tyrant and British agent Napoleon III, were always enemies of the U.S.A. and sympathizers of the Confederate States of America, as echoed by the appointment of Charles Bonaparte as Theodore Roosevelt's U.S. Attorney General.

5. Although the Spanish branch of the Habsburgs, the Hapsburgs of Charles I, Philip II, et al., came to an end with the War of the Spanish Succession, the depravity of Hapsburg Spain's tradition, including its racist role as the British monarchy's agent in the American traffic in African slaves, continued deep into the Nineteenth Century. This is continued as the internationally active pro-fascist, Carlist tradition of Philip II today, including its influence within the American Tory faction inside the U.S.A. today.

that point, that unless we make this change in policy-making practice, this crisis-stricken republic of ours will now soon vanish from the planet.

Thus we have the bare beginning of a phase-shift, from “free trade,” toward “fair trade,” announced by, among others, Senators Daschle and Lott, and President George W. Bush. There are principles of science involved, which, unfortunately, virtually none of our current batch of academic economists appear to understand. For the sake of our nation, and our posterity, you must rise to the standard of true citizens, and must therefore now come to understand those principles.

Vernadsky and LaRouche

Since the issue here, is a matter of strictly scientific import, I must define the credentials for my argument accordingly, but I must do that also as quickly as is allowable. So, we have the following paragraphs.

The great Russian biogeochemist Vladimir I. Vernadsky and I came separately, by somewhat different routes, to broadly similar conclusions. He as a premiere geologist in the footsteps of one among his former teachers, the great physicist and master-builder Dmitri I. Mendeleyev; I, as an opponent of the doctrines of Immanuel Kant, and therefore those of the hoaxster Professor Norbert Wiener. I summarize, as concisely as possible, the crucial points which I have elaborated in earlier published locations.⁶ Combined, these represent the most essential foundations of contemporary economic science. Certain differences between my own discoveries and those of Vernadsky, are crucial. I shall identify these differences at the relevant point.

Vernadsky used geology as the principal evidentiary basis for showing that our planet has been increasingly dominated by the accumulated effects of a principle of action we identify, in commonplace usage, as “life.” He demonstrated, by the most rigorous, relatively exhaustive standards of experimental scientific proof, that the relevant processes of life are not an expression of any physical principle situated within what experimental methods define as a non-living, i.e., *abiotic*, universe. On the basis of that proof, Vernadsky went further, to show, also, that the effects of human cognitive processes, which he named *noësis*, generate changes in the biosphere which can not be attributed to action by either principles specific to the abiotic universe, or the activity of living species other than mankind.

In this respect Vernadsky followed all the great modern physical scientists, from Cusa’s original definition of modern experimental physical science, in his *De Docta Ignorantia*, through such avowed followers of Cusa as Leonardo da Vinci and Kepler. As Kepler emphasized in making the original discovery of a principle of universal gravitation, we know universal physical principles only by proof of their existence

as such principles. We derive that proof from what can be shown to be a universally valid, experimental demonstration of *their physical effects*. Therefore, all principles known through this experimental method, are defined as universal physical principles, as Vernadsky did, because they are proven to be principles by their physical effects.

My own 1948-1952 approach to a related conclusion, began along a different track than Vernadsky’s work. I started from a defense of Leibniz’s *monadology* against the attacks on this by the neo-Aristotelean empiricist Immanuel Kant’s series of so-called *Critiques*.⁷ Before my encounter with an advanced-publication copy of Wiener’s *Cybernetics*, at the beginning of 1948, I had already accepted the argument for the existence of life as representing a universal, anti-entropic physical principle not to be found within the experimental bounds of an ostensibly entropic, *abiotic* phase-space. From my standpoint, Vernadsky’s work has two flaws of incompleteness which must be corrected for the sake of a competent economic science.

First, from my overview of Vernadsky’s work as expressed by those Russian and other specialist sources who could acquaint me with his available writings: to this day, I turn up no evidence that he grasps the most crucial aspect of the way in which an individual’s discoveries of universal physical principles are effectively socialized as a mode of generalized social cooperation, as in economic processes.

Second, although Vernadsky shows interest in taking up the study of Bernhard Riemann’s work, there is no evidence presented to me by relevant sources, that he succeeded in completing a competent study of even the most crucial features of Riemann’s discoveries.

It is on these two, interdependent points—1. the notion of relatively perfect sovereignty of the individual’s cognitive (e.g., *noëtic*) processes; and, 2. that the evidence is that our universe is of an *anti-Euclidean*, not *non-Euclidean*, type of physical geometry typified by Riemann’s discoveries—that I succeeded in cracking the principal riddle of long-range economic forecasting up to that time. At least, that is what I have accomplished to the extent that success can be considered as in any sense approximately completed.

From my Riemannian standpoint, viewing the work of Vernadsky, Vernadsky’s universal *Noösphere* is composed, in the appropriate technical language, of three distinct but “multiply connected” phase-spaces. These are defined, descriptively, as: the *abiotic*, *living*, and *cognitive*. The first of

6. E.g., Lyndon H. LaRouche, Jr., *The Economics of the Noösphere* (Washington, D.C.: EIR News Service, 2001).

7. Kant’s attacks echo that of Leonhard Euler’s 1761 *Letters to a German Princess*. The issue of method is that same which led Euler to the folly for which he was subjected to devastating criticism by Gauss’s proof of the significance of that complex domain which Euler had foolishly, stubbornly insisted on disregarding as allegedly “imaginary numbers.” This is the issue which separated Leibniz, Kästner, Gauss, Carnot, Monge, Fresnel, Ampère, Weber, Dirichlet, and Riemann from the axiomatically reductionist school of Euler and such of his followers as Lambert, Lagrange, Laplace, Cauchy, et al.

these three is ostensibly what is described as characteristically *entropic*, by such as Clausius, Kelvin, Boltzmann, et al. This from the standpoint of most experimental work thus far. The latter two, while mutually distinct otherwise, share the quality of being characteristically *anti-entropic*, and the latter are superior over the long sweep to the former, as Vernadsky emphasizes the geological evidence for the case of the *Biosphere*. Although the three phase-spaces are of a different essential quality of action, their effects are demonstrated by the physical result of their action. Thus, all three must be considered, equally, as experimentally defined phase-spaces of *universal physical principles*.⁸

Thus, it becomes a fundamental principle of a science of physical economy, that mankind's cooperation in applying discoveries of universal physical principles, has the effect of adding a *specific quality of anti-entropy* to the combined living and abiotic domains on which that cooperation acts. That definition then serves as a summary of the essential principle of a science of physical economy.⁹ In first approximation, that signifies *anti-entropic*, long waves of increases in the potential relative population-density of society, as measurable per capita and per square kilometer of the Earth's surface-area.¹⁰

The distinction of competent modern scientific method, is typified in a crucial way by the combination of Leibniz's original discovery of the calculus, on the basis of the specifications provided to "future mathematicians" by Kepler, and the related outcome of Leibniz's collaboration with Huyghens, Jean Bernouilli, et al., in developing the implications of Fermat's discovery of a *universal physical principle of quickest time*. The implications of this principle of quickest time were drawn out to the effect of a crucial outcome, in the study of the curve known as the *catenary*. The example of the catenary, provides one of the relatively most accessible classroom examples of the difference between "ivory tower"

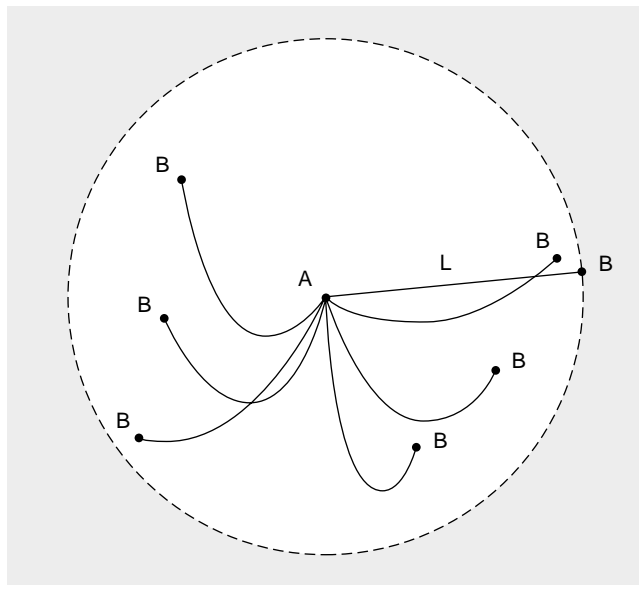
8. For reference: in addition to the writings published in locations such as the book on the Noösphere, above, one should register the lectures delivered to the Moscow Lebedev Institute, in June 2001 (Lyndon H. LaRouche, Jr., "V.I. Vernadsky and the Transformation of the Biosphere," *EIR*, July 27, 2001), and my December 2001 Moscow address in memory of my friend, Russia's scientist Pobisk Kuznetsov ("Russia's Crucial Role in Solving the Global Crisis," *EIR*, Dec. 28, 2001).

9. Hence my warnings against attempting to use the presently conventional notion of "energy" as the basis for physical theory. Energy, as presently, conventionally defined in design of mathematical functions is intrinsically, ontologically entropic. The fault in that popular classroom convention, is that the universe as a whole is both energetic and also characteristically anti-entropic. Therefore in physical economy, we must use the notion of anti-entropy where reductionist would write "energy." Anti-entropy becomes a standard for defining a general meaning for energy.

10. This use of "long waves" should be both compared with, and contrasted to so-called Kondratieff "long waves." Kondratieff was correct in his emphasis on the importance of empirical evidence of long waves associated with the insertion of technological impetus to economies, but the reading of his work is incorrect when it avoids the philosophical "voluntarism" inherent in the actual generation and behavior of those long waves.

FIGURE 1

Generation of the Catenary



The catenary is formed by suspending a chain between two fixed points. Varying the endpoint position of the chain generates a family of catenaries.

mathematics and the mathematical physics required for comprehension of a science of physical economy.

What Is 'Physical Geometry'?

For the necessary information of the layman, the following summary exposition is supplied.

Visualize a so-called "hanging bridge," typified by a rope-bridge used as a walkway across a chasm. The "hanging-chain" form of this bridge, under undisturbed conditions, is defined by the physical-geometric form known as the *catenary*, as distinct from the ivory-tower approximation known as the *cycloid*. The physical significance of the catenary, is also effectively illustrated by the way in which the great Fifteenth-Century architect Brunelleschi constructed the cupola atop the famous Cathedral of Florence. That is the physical "secret" of the design, construction, and continued stability of that cupola.¹¹

This curve is best introduced to the classroom as a special kind of what can be readily demonstrated to be apparently motionless motion (**Figure 1**). This phenomenon of "motionless motion," expresses a boundary-condition in physical geometry. Watch the Andean villager, for example, walking

11. This shows the incompetence of the advisors to one government of the municipality of Florence, whose folly threatened to bring about the destruction of the cupola, through proposing to fill up the holes which a prudent Brunelleschi had built into the design.

across that hanging bridge. His steps perturb the bridge, which always acts toward bringing itself back into its quiet, hanging-chain form of the action of *motion in a state of undisturbed equilibrium*.¹² This is also expressed as the Leibniz-Bernoulli definition of a principle of *quickest time*, rather than shortest distance, as expressed in the generalization of refraction of electromagnetic radiation.

The fact is, that refraction follows what is known, since the work of Christiaan Huyghens, as an *isochronic* pathway.¹³ This pathway, which turns out, as Leibniz and Bernoulli show, to correspond to the functional notion of the catenary-principle, confronts the student with the notion of a *physical geometry* in perhaps the clearest and simplest way. In place of the elements of a mere “ivory tower,” reductionist form of Euclidean or so-called non-Euclidean geometry, the silent motion of a catenary, as defined by the work of Leibniz and Bernoulli, replaces the notion of linear space-time at the blackboard, by the physical space-time of the real universe. As in the case of Kepler’s detailing the original discovery of universal physical principle of gravitation, in physical geometry, the simple lines of such ivory-tower mathematics as elementary classroom Euclidean geometry, are replaced by pathways of *action*.¹⁴

Thus on this, and cohering other accounts, the Leibniz calculus is premised upon the notion of the absolute non-linearity of the infinitesimal, in contrast to the linear bowdlerization of the notion of calculus and its functions, by Euler, Lagrange, Cauchy, et al.

Most of the worst systemic blunders perpetrated in the abused name of “mathematical economics,” are the result of precisely such elementary fallacies as Euler’s blindly fanatical defense of the so-called “Newtonian system,” as in such cases as his treatment of the differential and also his influential misdefinition of the determination of π . The silly, fraudulent *Theory of Games and Economic Behavior* of John von Neumann and Oskar Morgenstern, is an extremely perverted version of a radically reductionist, Eighteenth-Century attempt to degrade economics into radically linearized forms of “Robinson Crusoe” models. Naturally, the attempt to apply these linear models to shaping economic policy, leads to nothing but disasters for the nations influenced by the credulous dupes who rely upon such “ivory tower” concoctions in “systems analysis.”

On the basis of outgrowths of the work of Leibniz et al.,

12. Lecture by Bruce Director to the Schiller Institute Summer school in Oberwesel, Germany, August 2001. See also Bruce Director, “Riemann for Anti-Dummies: Justice for the Catenary,” *New Federalist*, June 25, 2001, p. 8.

13. Christiaan Huyghens, *The Pendulum Clock or Geometrical Demonstrations Concerning the Motion of Pendula as Applied to Clocks*, trans. by Richard J. Blackwell (Ames: Iowa State University, 1986).

14. So, Carl Gauss, by exposing the hoax of axiomatic faith in a notion of the simple counting integers as the basis for number, proved the physical quality of the complex domain, thus overturning the “imaginary number” hoax of Leonhard Euler.

Bernhard Riemann employed the discoveries of Gauss as the basis for establishing a coherent notion of physical, as opposed to either Euclidean and non-Euclidean varieties of “ivory tower” geometry. Riemann’s physical geometry, is an intrinsically anti-Euclidean geometry.¹⁵ It is to be contrasted to forms, such as so-called “non-Euclidean” systems, such as those of Lobachevsky, Bolyai, and Minkowski, which failed because their authors sought to reconcile intrinsically reductionist forms borrowed from “ivory tower” geometry with the experimental evidence of physical functions.

In physical geometry, we replace the notion of ivory tower definitions, axioms, and postulates, by experimentally defined notions of *extended magnitude of a universal principle of action*, such as the motion inhering in the existence of Brunelleschi’s use of the catenary. We replace all of the “ivory tower,” reductionist notions of definitions, axioms, and postulates, including notions of space, time, and matter, by the accumulated discoveries of experimentally proven universal physical principles. We define the notion of physical functions in terms of the experimentally defined, implicitly measurable functional relationships among sets of such extended magnitudes.

The Importance of Vernadsky

Once we have introduced the notions of Riemannian physical geometries to Vernadsky’s discoveries respecting the Biosphere and Noösphere, the primary basis for long-range forecasting emerges.

We assort known physical principles among the experimentally defined sets of what experimental methods define, respectively, as *abiotic*, *living*, and *cognitive* systems. We treat each of these three categories as what are called *phase-spaces*, signifying the open-ended set of known, experimentally validated, universal principles known to belong within that collection. Each phase-space is defined in terms of the characteristic features of itself as a whole, the characteristic features which, taken together, distinguish it experimentally from the other two.

From this vantage-point, we determine the characteristic interactions among the different qualities of such phase-spaces. The common feature of action which unites the three, is the notion of an experimentally definable universal physical principle. This common feature lies in the proof that each and all phase-spaces are defined, with equal authority, experimentally, by certain characteristic *physical effects*, as Vernadsky did this.

In other words, instead of treating the phenomena of sense

15. The term “anti-Euclidean” was introduced to modern science by the most important of the teachers of Carl Gauss, Göttingen University’s Abraham Kästner. Leipzig-born Kästner, among his other roles as a leading “polymath” of the Eighteenth Century, dedicated his life to defense of the legacies of both Leibniz and J.S. Bach, and was the teacher of Gotthold Lessing and the pivotal figure behind the launching of the German Classical revolution of Lessing, Moses Mendelssohn, and their followers.

perception as reality, we treat such mere phenomena as effects of man's physical relationship to a universe which actually exists as if "outside" the reactions it induces in our sense-organs.¹⁶ As Plato expresses this famously in his allegory of the Cave, what sense-impressions present to us are like the shadows cast on the irregular surfaces of the walls of a dimly fire-lit cave. Science begins with Plato's insight into that problem.

We must discover what is reflected as those shadows we know as "sense perceptions." We must overcome the ignorant prejudice which tends to prompt persons to project a literal, "ivory tower" sort of reading upon such shadows, as the reductionists do. We must discover the universally reliable principles, such as Kepler's original discovery of universal gravitation, or Fermat's discovery of a principle of quickest time, which define an efficient, practical connection between our actions on the universe and, the changes induced in the shadowy effects the universe provokes in our sense-perceptual processes.

To that end, we divide our categories of action into the three phase-spaces: 1.) experimental actions of a type attributable to an experimentally defined abiotic universality; 2.) experimental actions attributable to a principle underlying the universality of living processes; and, 3.) experimental actions attributable only to the principle underlying the form of *noësis* specific to the human species. That done, we must next explore the universality of the interactions among these three categories of phase-spaces. The outcome of those steps is the preliminary basis for constructing a Riemannian physical geometry of the type corresponding to a physical economy.

That much accomplished, the next step is to examine the primary functional relations among the three phase-spaces, as those functions may be apprehended by human cognitive functions.

Vernadsky already emphasized that although the action of living processes on the ostensibly abiotic Earth is relatively very slow, compared to the relative immediacy of reactions on the living from the ostensibly abiotic, the Biosphere exerts a cumulatively powerful effect of induced changes upon what experimental design defines as the functionally abiotic phases of the Earth's existence. He points to a similar long-range efficacy of improvements in the Biosphere effected by the impact of cognitive discoveries and application of universal physical principles. Consequently, either following Vernadsky, or extrapolating along the same lines of inquiry, we have two primary considerations leading to a certain general classification of the functional characteristics of relations of these interrelations among phase-spaces to the universe at large.

In this configuration, it is clear that the ostensibly rela-

tively weaker, ostensibly marginal characteristics of living processes, when considered over the long term, dominate what the short term presents as the ostensibly more powerful abiotic principles of action. Similarly, the principles of cognition, which, as the man-eating tiger pointed out to the man, are apparently weaker than non-cognitive aspects of the human biology in the short term, are stronger forces in respect to changing the "ecological" characteristics of society in the longer term (as the man with the rifle explained to the unhearing ears of the dead man-eating tiger).

The functional notion of *time* as such is shifted, from simply counting-numbers of clock-time, to the notion of relationships among the time scales, such as the ratio of abiotic to Biosphere cycles, and the relations among abiotic phases, the Biosphere, and effects of cognition on increasing our species' potential relative population-density with respect to cyclical trends within the abiotic universe and Biosphere in general. This departure from a naive reading of the counting numbers should follow Gauss's treatments of the matter, in both his *Disquisitiones* and his definition of both algebraic functions and the general principles of curvature.

Add to that, the following. Since unfathomed depths of ancient pre-history of mankind, it is mankind's observation of the stellar universe, and the cycles within the Solar System itself, which have defined even all those important ancient and even pre-historic calendars which society has used to regulate its internal affairs, and for astronavigation within and among the oceans of the world. The case of Kepler's actions establishing the foundations of modern comprehensive mathematical physics, is to be appreciated as an echo of the most ancient rudiments of science-ordered cultures.

Our notions of *space* and *matter* are presently defined by the realization that the space of our universe is not only extended into what seems to be the infinitely large and also the infinitesimally small. These extremes are not only notions of spatial relations, but involve the increasing realization, today, that as we go deeper into the submicroscopically small, the apparent characteristics of physical action and interaction change, in the same general sense as Wilhelm Weber's proof that, within the very small, the apparent effect of the so-called "Coulomb Force" is reversed, in a way which makes the existence of the universality of nuclear fusion "possible." Indeed the very existence of distinct microphysical elementarities, as distinct from merely local zones of probability (or, "improbability") signifies that the nature of "matter" must be situated, as a functional conception, within a "monadology" of functionally defined existences in the very small.

In general, therefore, economic processes can not be competently defined in terms of extrapolating from local examples in local space-time, but must, like the Leibniz calculus, define the functional meaning of, the outcome of, the local change, in terms of long-ranging cycles in space and time, just as Kepler made the original discovery and definition of the principle of universal gravitation.

For this latter purpose, the general notions of both rela-

16. Naturally, strictly speaking, the sense-organs exist within that universe, but, we must treat them, in first approximation, as outside the universe as universe is defined naively by those poorly educated people who are, by far, the most numerous throughout this planet today.

tions within a three-phase-space universe, and the galactical settings of those relations, must be employed to understand what we should recognize as the medium- to long-range cycles in economy, and the consequent significance of those willful changes in those cycles, which we are able to introduce through changes introduced in the small.

2. Practically Applied Economics

The most immediate practical reflection of the general scientific considerations just summarized, is the applicability to economics of the notion of *characteristic* values. This is the form of that notion derived, most immediately, from the argument of Riemann's celebrated 1854 habilitation dissertation. This notion is key to understanding the practical implications for the U.S. and world economies, of a cultural-paradigm shift, from the notion of a "consumer society" inhering in that delusory belief in "free trade," which has ruined the economies of the Americas and Europe, and back to that contrasting notion of a "producer society," inhering in the relatively successful, pre-1965 policy of "fair trade."

The applicable notion of *characteristic*, is the notion of a characteristic relative *curvature* of a definable physical space-time "geometry." This can be read, for the practical purposes of applied economics, as the variability of the effect of what is apparently the same quality and quantity of productive action, in one economy, as compared with the effect of that same apparent quality and quantity in another. This means, for example, that the same person, performing the same production action in one economy, will have a different net effect on the total economy than in another. This difference is broadly attributable to the notion of relative curvatures of the differences in "physical space-time" between the situations represented respectively by two cases.

The most obvious examples of the origins of such differences, are differences in basic economic infrastructure, cultural development of the labor-force, even the climate, and so on. A society with abundant energy, is more productive than one without. A society which relies on energy-generating sources of higher energy-flux density, will be able to become far more advanced technologically. A society which produces high-efficiency forms of chemical fuels, as a by-product of operations of high-energy-flux-density power-generating facilities, will be far more productive than one which transports fuel into localities over long distances.¹⁷ A society

17. For example, consider the significance of the ratio of the cost of transport to the value of that which is being transported, or the cost to the employee, the employee's family household, and the society of increasing the cost and lost time incurred by increasing the average commuting-time to and from a place of work. Shipping raw materials around much of the world, is inherently wasteful. The preferred general rule should be that processed, "worked-up" raw materials should be those usually shipped from the place of their extraction; thus, efficient mass transit, especially transit within the framework of "development corridors," should be general infrastructure policy. Any contrary policy lowers the productivity of the economy.

within efficient mass-transit networks, is more efficient than one which substitutes highway-transport for mass-transit. The density of supply of potable and otherwise usable water, is a leading boundary condition affecting the relative *characteristic* of the economy.

The principle to bear in mind in comparing "free trade" to "fair trade," is the principle, that the value of the action lies not merely in the action itself, but in the situation in which it is located. The difference between a "free trade" and "fair trade" economy, is such a determining situation. This is a matter of *characteristics* of national economies as coherent processes. The object of national economic policy is to establish a form of economy with increasingly higher such *physical-economic characteristics*.

There is another type of determination of that economy's characteristic productivity. The conflict over the choice of "free trade" or "fair trade," typifies this kind of difference in effect.

Thus, the difference between successful growth and apocalyptic disaster in an economy of otherwise similar technology, may lie in the choice of employed, or excluded "protectionist" and related measures by governments. The catastrophic outcome of "free trade" doctrines for the U.S. economy, as contrasted with the successful "fair trade" trend of 1933-1964, is an example of this.

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Capital Cycles

For reasons which should be implicitly obvious from what is written above, the general level of economic potential of a society is determined, prior to considering the superimposed, relevant monetary-financial system, by its degree of effective increase of the *physical, not financial*, capital-intensity of its total environment, per capita, especially in the domains of basic economic infrastructure and the design and production of physical goods.

Once again, this means the physical capital-intensity of investments, not necessarily the financial ones. In fact, as the recent thirty-odd years' experience shows, the trend of increasing emphasis on "free trade" over that period has been to increase the per-capita financial-capital concentrations by means of looting the real capital investment virtually into rubble. The chief cause of the world's present monetary-financial and economic collapse has been this trend, as shown in my Triple Curve summary of this, in cannibalizing physical capital to provide stimulus for the hyperbolic inflation of financial capital (**Figures 2-5**).

The first of these four charts was first circulated at the close of 1995, as a portrait of the then continuing pattern of shifts in ratios of net physical output, monetary growth, and increase of nominal financial accumulations since approximately the savage cuts in the Kennedy space-program, during U.S. fiscal year 1966-1967. The second shows the effect of a shift in the pattern which hit the U.S.A. in particular approximately Spring-Summer 2000, at which the amount of monetary expansion needed to prevent a collapse of the financial sector, was greater than the amount of the financial values being "bailed out" by monetary pumping. This represents a cross-over like that which occurred in Weimar Germany during June-July 1923, the point at which the monetary hyperinflation erupted, bringing Germany's currency to a state of collapse four to five months later. The third and fourth figures show the actually reported figures for the recent period, including the evidence of the cross-over effect, from slow inflation, to hyperbolic hyperinflation.

These charts illustrate dramatically, the fatal error of continuing the management of a national economy according to the yardstick of a notion of "shareholder value" premised on a financial market for shares and kindred nominal assets. The charts illustrate the fact, that the attempt to maximize the financial shareholder value, results, inevitably, in the destruction of the physical economy on which the financial market-economy's continued existence depends. This is the lesson which should have been learned from the Weimar Germany hyperinflation of 1923. It is the painful lesson being taught to the Bush Administration, and many others, right now. Harvard's late Professor Santayana would understand.

Conversely, this illustrates the point, that had "free trade" policies not been in effect, instead of the pre-1966-1971 protectionist policies, the present collapse of the U.S. physical economy could not have occurred. High rates of taxation, and related regulatory measures, which give preference to capital

FIGURE 2

A Typical Collapse Function

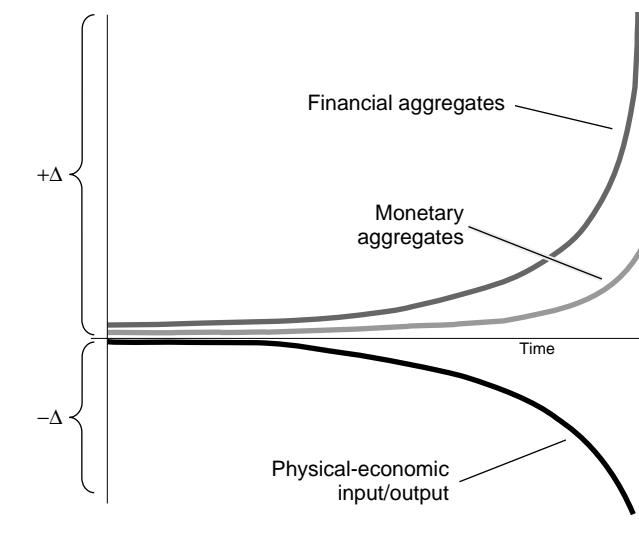
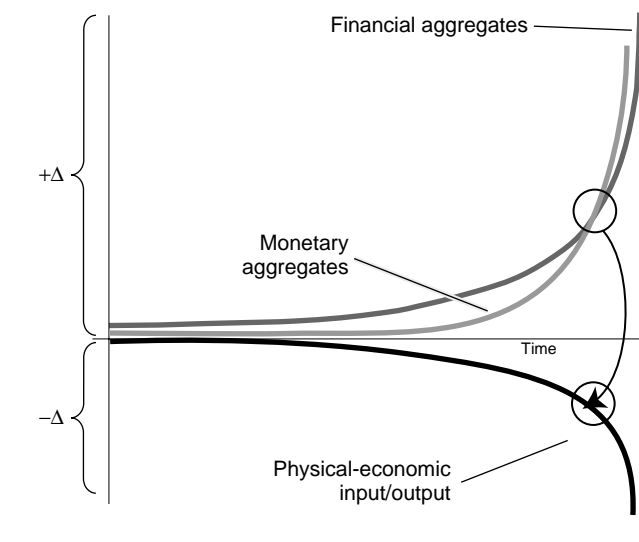


FIGURE 3

The Collapse Reaches a Critical Point of Instability



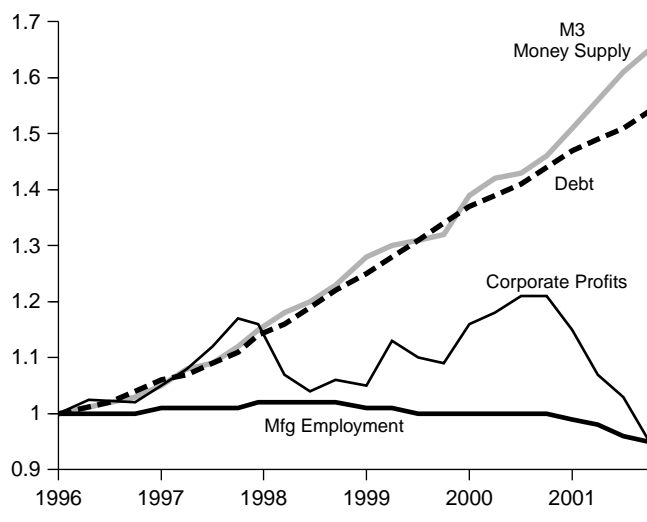
improvements in physical productivity, over purely financial capital gains, would have "herded" capital flows into areas which are beneficial, and away from the disaster built up, especially, since President Nixon's fateful folly of August 1971.

Government responsibility for basic economic infrastructure, and minimum-wage requirements, expresses the same principle.

Without mass-transit, stable prices of more than merely

FIGURE 4

The U.S. Economy's Collapse Function Since 1996

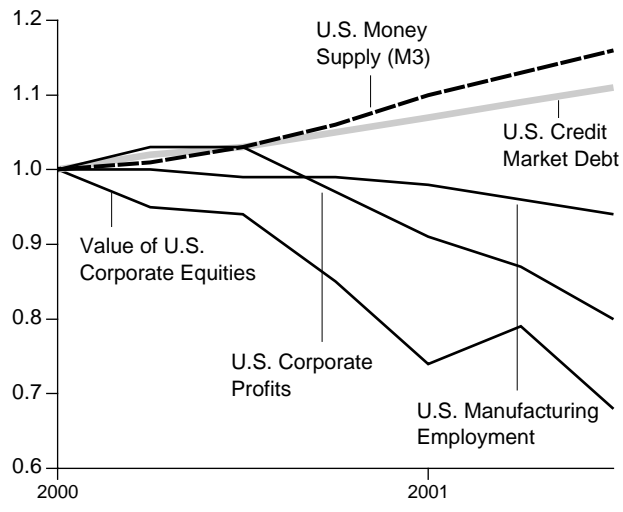


Source: EIRNS.

FIGURE 5

U.S. Economy's 'Triple Curve' Collapse Function, 2000-2001.

(Indexed To 2001/1Q = 1.00)



Sources: U.S. Department of Commerce, Federal Reserve.

adequate energy-supplies, and large-scale water management and sanitation, the real productivity of the so-called private sector would collapse. Without "fair price" policies, which protect investments into medium- to long-term capital investments in capacity, relative physical productivity, and product quality of categories of production and distribution, the rate

of investment will be either inadequate to realize productive potential in the private sector, or will lead to a collapse in essential investment in production. Without minimum-wage ("fair wage") requirements, the quality of labor-force needed, will neither be produced, nor maintained. Infrastructural investments in a successfully growing modern economy, range in the order of about half the total investment, much of either by national, regional, and local governments combined, or by public utilities regulated by those governments.

Public investments in such areas of basic economic infrastructure as education and health-care systems, especially the institutional features of the latter, are crucial. These measures at various levels of government, as supplemented by necessary regulation of the financial flows within the private sector, are the indispensable, global features of economy which largely determine the relative characteristic effects of action by local private entrepreneurial and other interests.

The contrary, "free trade" practices, are argued from the following, pathological standpoint.

The "free trader's" argument proceeds from the pathological presumption, that the national product of an economy is the sum of the financial income of the sum-total of the combination of private enterprises plus incomes of the population from other sources, including payments of wages, salaries, and social benefits, by government agencies. Worse, it is also proposed, that the national productivity is determined as the ratio of the total financial profit of private enterprises, to total expenditures by the economy as a whole. Therefore, the systemic slaughter of a large portion of government employees, the unemployed, and welfare recipients, would be viewed as a source of improvement in national productivity. We saw the latter such practices carried into action with Adolf Hitler's precedent for his war-time death-camp system, with his own, 1930s, HMO-like health-care policy respecting "lives not worthy to be lived."

So, we have the lunacy of the recent decades, since Brzezinski's tool President Carter, especially the madness which took over during the 1990s, in which the majority of the Congress cared almost nothing for the real economy, but only for "the market" from which the largest sources of campaign contributions were anticipated. The way in which the Congress complicitly created the deregulatory environment in which the Enron bubble was crafted, is typical of "free trade" pathology carried to its implied extreme.

Dupes have argued that such "free trade" practices are "solid capitalist principles." That opinion is pure fraud. Treasury Secretary Alexander Hamilton, like all other well-informed proponents of the American System of political-economy, warned against exactly such fraud. The promotion of the creative powers of the individual members of society, is the overriding imperative of policies consistent with the American System of political-economy.

It is, primarily, the medium- to long-term cycles, defined as cycles of development and attrition, which are expressed



Gas ovens at the Dachau concentration camp. According to the free trader's argument, LaRouche writes, "the systemic slaughter of a large portion of government employees, the unemployed, and welfare recipients, would be viewed as a source of improvement in national productivity. We saw the latter such practices carried into action with Adolf Hitler's precedent for his war-time death-camp system, with his own, 1930s, HMO-like health-care policy respecting 'lives not worthy to be lived.' "

as what should be the leading features of capital cycles considered in policy-shaping. The typical definitions of long-ranging cycles relevant to presently urgent considerations of policy-shaping, are two half-cycles, each of approximately a quarter-century span, each of which corresponds to the lapse of time required to transform one of today's newborn infants into a biologically mature young adult qualified to undertake a professional career. We must pay out for the development of that new individual, during much or most of the first quarter-century, and should anticipate recouping the investment in that development made during the first quarter-century, during the second. That two-phased capital cycle, of approximately fifty years range, is the proper, primary basis for economic policy-shaping under the constitutional general welfare principle of our Federal republic.

Among the most crucial fallacies of accounting practice, is the *post hoc, ergo propter hoc* delusion, that a list of the items in the consumed bill of materials and process sheets, have been the cause of the physical and financial output of the enterprise in question. Typical of the lunacy with which such delusions have been applied to assessing national net product during the recent thirty-odd years, has been disregard for the uncounted, but actual costs buried in the category of attrition of earlier improvements in basic economic infrastructure. The general, foolish presumption of the apologists for such "fiscal austerity" plundering of wealth being depleted, is that if the bridge did not collapse immediately once the maintenance is discontinued, the result is a cost-saving to be merrily added to the "bottom line."

The nation has lately been presented, more and more, with the unpayable accumulation of unpaid bills from the

production of the past. Our nation has not reproduced the preconditions on which past production of wealth has depended. On this account, financial accounting methods have been essentially fraudulent, and increasingly so as the unpaid such bills to the account of "fiscal austerity" pile up.

All other significant cycles of the economic process are to be gauged against that primary, approximately fifty-year cycle. At this point, focus our attention on two crucial aspects of the physical-economic process: the proper meaning of "entrepreneur," from the standpoint of the American System; and, the role of the technological composition of employment of the total labor-force. Both of these issues have been addressed in my "Economics: At the End of a Delusion."¹⁸ I focus on certain features of those matters bearing directly on the matter of "fair trade" issues.

Entrepreneurship and Creativity

The principal cause for the failures of socialist economists and governments, is that widespread abhorrence of philosophical "voluntarism" traditional to those circles. For precisely such reasons, small or mass-based socialist parties tend to be dominated by the suffocating weight of the "bureaucratized" intellectual mediocrity inhering in anti-"voluntarist" emphasis on "historical objectivity." A different form of expression of exactly the same net failure in performance, is typical of the large corporate "shareholder" enterprise, when its performance is contrasted with the greater alacrity of the private enterprise which is dominated by considerations of

18. *EIR*, Feb. 22, 2002.



The general, foolish presumption of the apologists for “fiscal austerity” plundering of wealth being depleted, “is that if the bridge did not collapse immediately once the maintenance is discontinued, the result is a cost-saving to be merrily added to the ‘bottom line.’ ” Here: the result of fiscal austerity in West Virginia.

entrepreneurial mission. I mean “mission” in the sense of military, or scientific mission-orientation.

The best choice of model of reference for defining the role of the true entrepreneur in the national economy is the following. Look at this case by comparing him, or her, to the junior officer or non-commissioned officer of a well-trained and well-led military force, who understands the difference between the mission assigned to him, and his, or her obligation to develop the specific tactical approach suited to the local situation in which the intent of the mission is to be realized. The best aspects of the military tradition in the German military since Gerhard Scharnhorst’s reforms, the leadership of “Old” Moltke, and of Lazare Carnot for France, merely illustrate the point.

This is, not accidentally, the source of the superiority of a military force based on universal military service and a reserve system, over the replacement of universal military service by those so-called “professional” armies which tend to degenerate, internally, into utopian parodies of the old Roman legions at their worst. It is by drawing into military service the portions of the population with the greatest relative inclination and capacity for science-driven, Classical culture-driven, and kindred mission-orientations in life in general, that the quality of the military force as a whole is honed to the high quality which Carnot and Scharnhorst sought with their epoch-making reforms.

Look at the point of coincidence between the military mission-tactics, and the function of the science-engineering-oriented entrepreneur in the national economy.

The general promotion of increase of the productive powers of labor in the economy as a whole, depends largely on

the functional relationship between the section of the economy best conducted by government, basic economic infrastructure, and a private, science-technology-driven entrepreneurial sector. The former is responsible to create the conditions required for the functions performed by the latter, and the latter is to provide the realized increase of both the qualitative and quantitative increases in the productive powers of labor for which the development of infrastructure (the “situation”) is indispensable.

The crucial factor in entrepreneurship, is typified with a certain exceptional excellence, by the role of the scientific mind in the tradition of Leonardo da Vinci, Kepler, and Leibniz. It is these qualities of the individual mind, and nothing else, which are the source of the general improvement, and the productivity of society. Society must be organized, therefore, to promote that specific

quality of benefit to the present and future generations of the society as a whole.

The crucial difference between the large industrial and kindred corporation, and the technologically progressive entrepreneurship, is that the large corporation, at its relative best, is an instrument for mass production, whereas the entrepreneurship is the portion of the business community which is committed to scientific and technological progress in designs of products and productive processes, for their own sake. At its typical worst, the large corporation is an absentee landlord, whose zeal for milking the cow today, outweighs the improvement of the herd for tomorrow. Moreover, in modern economy, the large corporation, even at its best, would fail in its mission, without the role of many progressive entrepreneurs as its own crucial vendors.

In the exception which might seem to disprove the rule, we find the corporation which has accepted a special mission, which it then delegates to an entrepreneurial-like team within its structure. U.S. military development and space programs, are typical of some of the best of these cases. The corporation is, therefore, sometimes successful almost despite its character as a shareholder-controlled (i.e., Wall Street financier-controlled) entity.

In the second example, as I have emphasized in “Economics: At the End of a Delusion,” the upgrading of the technological composition of employment of the labor-force, to increase the relative numbers of scientists, engineers, and technologically highly-skilled machine-tool-grade and kindred operatives in the labor-force, complements the role of the effective entrepreneur in increasing the rate at which technological progress is effectively expressed in the improve-



A small-scale experimental plant for making a new, high-quality liquid fertilizer. The upgrading of the technological composition of the labor-force, complements the role of the effective entrepreneur in increasing the rate at which technological progress is expressed in the productive process.

ments of designs of products and productive processes.

It is the fostering of the increased rate of discovery of universal physical principles, and the application of those principles, as technology, which, alone, enables society to maintain and increase its potential relative population-density. That is the only true source of physical-economic margins of profit for the economy considered, over the long-range, as a whole. It is those small changes, effected during shorter intervals, which introduce new cyclical factors of technology into the productive process, which are the direct source of improved and continued profitability of the economy as a whole.

It is providing the infrastructure needed to establish the situation appropriate to successful attempts at applying factors of technological progress, which will determine, chiefly, whether the effort of the producers succeeds or fails, either relatively, or even absolutely.

However, there are two other decisive factors embedded in that process just so summarized. One is the role of monetary-financial-taxation systems. The other shifts our attention to a matter of principle which was not taken into account in

Vernadsky's definition of the Noösphere, the characteristic economic role of social relations as such within the population.

3. Pricing and Finance As Situational

Begin the discussion of that matter of social relations with some leading illustrations, and then employ those cases to aid us in focussing on the matter of the underlying principle as such.

When a long-term loan is issued to a nation for some project, the true cost of the loan must include the accumulation of consistently defined debt-service charges over the economic half-life of the project as a whole. In general, the experience has been, that when long-term loans are within a range of between 1 and 2% rates of simple, uncompounded interest accumulations, and under conditions in which the parities among the currencies used do not change appreciably, valid investments in basic economic infrastructure and production projects are manageable forms of international and domestic loans for purposes of physical-capital formation.

However, if currency values fluctuate, if interest-rates rise, for that or other reasons, what began as an effective program of lending, launched for the ostensible purpose of economic development, may be transformed into a predatory form of financial parasite. This kind of transformation was characteristic of the new situation of outstanding debts of the nations of South and Central America, among others, following Nixon's August 1971 actions, and emphatically the case after 1977-1982 developments within U.S. policy toward Argentina, Mexico, and Brazil.

One report of such typical results of decadence in international financial policies, is the description of a predatory system of international loans, by former U.S. State Department specialist Herbert Feis. This phenomenon has been one of two principal reasons for the worse-than-failure of the policies and performance by institutions such as the International Monetary Fund and World Bank during the recent thirty years.

That choice of upper limit on allowable rates of charges on international and domestic infrastructural and related development loans, is relative, not absolute. However, it corresponds to the typical rates of patterns of growth in the relevant investments which were achieved during the past century's experience, and must be accepted as representing a kind of approximate barrier to rises in debt-service costs to borrowers, of lending and investments of money and credit, for that reason, if no other.

There has been a second, uglier feature for the moral failures of IMF and World Bank practice since 1971. Only typical of this: under the Nixon and Carter administrations, the U.S. and other governments and related institutions, have followed

the policies which the Venice faction's Giovanni Botero had introduced, in an English translation, to James I's England.¹⁹ Agencies such as the IMF and World Bank, adopted a neo-Malthusian policy of using the leading monetary and financial systems under control or influence of leading governments, to increase the mortality rates in regions of the world. This pro-genocidal policy was emphasized in the case of sub-Saharan Africa, but was by no means limited to Africa.

During his tenure as President Nixon's National Security Advisor and Secretary of State, Henry A. Kissinger was explicit on stipulating that Malthusian intent for U.S. and other nations' policies.²⁰ The same trend was continued under Brzezinski's President Carter, as typified by the radically neo-Malthusian Global 2000 policies presented after the resignation of Secretary of State Cyrus Vance.

A similar consideration confronts us as the challenge of "fair trade" policy-making. When a minimum price-level is set on a class of production, the intended effect should be to ensure that a financial margin for replenishment and accumulation of financial capital is built into the producers' and distributors' price at which an estimated volume of the product is sold. This can be accomplished through "fair price" policies, or by "fair trade" tariffs, or other measures to kindred effect. A similar purpose is served by health-and-safety regulations, and regulations to ensure quality of product. Taxation policies can be designed to similar effect, as the Kennedy investment-tax-credit policies illustrate the point.

Such physical-capital accumulation is the form in which the accumulation of medium- to long-term *physical* capital is built into national policy. Such dirigist measures not only favor certain forms of financial accumulation. These are also means for steering such financial accumulations into creation of production-related physical capital. The latter is typical of the indispensable measures by means of which government, or government-blessed private practices, steer financial flows through the economy in such a way as to promote both physical capital accumulation and the scientific and technological progress which such capital accumulation encourages.

For related reasons, a relatively fixed-rate international financial system, such as the gold-reserve-standard system operating during the first two post-World-War II decades, is indispensable for promotion of both domestic and international capital investment, and the increased trade, technological progress, and increase of productivity, which such measures make possible.

19. *Della Ragion di Stato* (1589).

20. National Security Study Memorandum 200, "Implications of Worldwide Population Growth for U.S. Security and Overseas Interest," Dec. 10, 1974, was a classified report, authored under the personal direction of then-National Security Adviser Henry Kissinger. It characterized the growth of population in 13 Third World countries as a national security threat to the United States. NSSM-200 was declassified in 1990. For excerpts, see *EIR Special Report*, "The Genocidal Roots of Bush's 'New World Order,'" May 1992.

By themselves, such protectionist measures do not raise the level of performance of economies fully to the degree which might be achieved through available levels of technological development. Therefore, the addition of special, large-scale science-driver programs, such as an aggressive program of development steered by mission-oriented space and related programs, is sometimes indispensable, to drive the rate of scientific and technological progress to the levels needed, for example, to catch up for the attrition of the recent thirty-odd years.

In general, economies do not progress, or, at best, not very much, unless they are dominated by mission-oriented policies of the quality and type associated with great projects. These must be, necessarily, largely undertakings by government, or concerted action by governments. Otherwise, although the benefits to the private sector are enormous, the programs will not be raised to presently desired levels of performance without a leading role of government in sponsorship and participating in such projects.

The rate of realized benefit from the introduction of improved technologies of practice by entrepreneurs, is limited by the rate and direction of changes in the local, regional, and even international economies and their markets, in which those enterprises are operating.

One outstanding example of this is the case of the Tennessee Valley Authority project, launched by and under President Franklin Roosevelt. The leading achievements of local enterprises in that region, small and great, depended upon the government's initiative in making those local innovations possible.

The highest rate of growth of potential point-of-production productivity in the U.S. economy during the post-war period, occurred, during the period into the mid-1970s, as a side-effect of the Kennedy-boosted commitment to a targeted landing of man on the Moon. The savage cuts in the space program, which had begun during 1966-1967, prevented a continued generation of such benefits much beyond that. The savage anti-technology policies under the administration of Brzezinski, Carter, and Alan Greenspan's predecessor, Federal Reserve Chairman Paul Volcker, ruined and reversed, and have continued to reverse, to the present day, all of the trends toward progress in agriculture, industry, infrastructure, and the conditions of life of the lower eighty percent of U.S. family-income brackets, which had been set into motion over the 1933-1964 interval and slightly beyond.

The general level of education in the population, which tends to determine what is possible by enterprises operating that market, is one example of this. In better decades past, local entrepreneurs would be among those campaigning for, and aiding programs of improved education in schools and universities, and in adult education. These efforts addressed changes which could not be accomplished by individual enterprise alone, but required action taken through government's unique qualifications, means, and responsibility for changing the situation in the society at large.

Therefore, government must be induced to assume its role of leadership in such actions. Programs such as “crash program” efforts in the nation’s space-exploration and related developments, as in public-health matters, are indispensable. The foolishly abandoned, former Hill-Burton law, is an example of such a show of responsibility for leadership by government. As in that case, government must often act to make effective cooperative efforts otherwise undertaken by private and local initiative.

The same principle would be expressed by introducing a revolution in public and higher education, reversing the trends in educational policy and practice of the recent forty-odd years. Education, when intended to bring the future citizenry as a whole up to a mission-defined standard of scientific and technological progress, and related goals, has within it many of the contributing features required for such science-driver projects as a mission-oriented space program.

The essential thing about such urgently needed reversals of three decades of corrosion in educational policies of practice, is that a Classical humanist education, which is one premised chiefly on the student’s replication of original discoveries in science and Classical art-forms, defines the relations of the student to education, teacher to student, and student to student, as a quality of social relations which is essentially cognitive, rather than the quality of learning better suited to lower forms of life. It is that standard for social relations, and for the relationship of persons to ideas, which is the essential kind of underlying form of protectionism upon which the desired progress of the economy, away from present trends into decadence, is fostered.

Liberal Sponsored Insanity

The chief opposition to those elementary principles of political sanity in U.S. national economic policy today, is typified by the combined fanaticism of, on the one side, those present-day Republicans who began their present phase of metagenesis as self-styled Democratic Party “boll weevils,” and, on the other side, the Democratic Leadership Council cult of sometime Vice-President Al Gore, who represent, in fact, the virtual “boll weevils” which now-Senator Phil Gramm left in the Democratic Party as “stay-behind” agents of the same neo-Confederacy, Nashville Agrarian-like philosophy as his own.

This liberal-economic fanaticism, whose effective characteristic is that of a kind of politically infectious mental disease, is often presented as the gut-instinct irrationalism of the typical American populist. This populism, to which the appeals of Milton Friedman, Phil Gramm, and kindred pitchmen are chiefly directed, is fairly described as a rather popular, fraudulent misconception of “freedom.”

The typical, fraudulent defense of economic and political anarchy, of the hard-boiled, fanatical American populist, is the false charge, that it is government intervention “from the top” which is the cause of all of the afflictions suffered by the underlings of society, such as themselves, at the bottom.

Naturally, such notions of anarchic freedom have provided the chief sources of mass-recruitment to fascist and fascist-like movements and governments over the course of modern history since the July 14, 1789 hoax known to history books as “the storming of the Bastille.”²¹

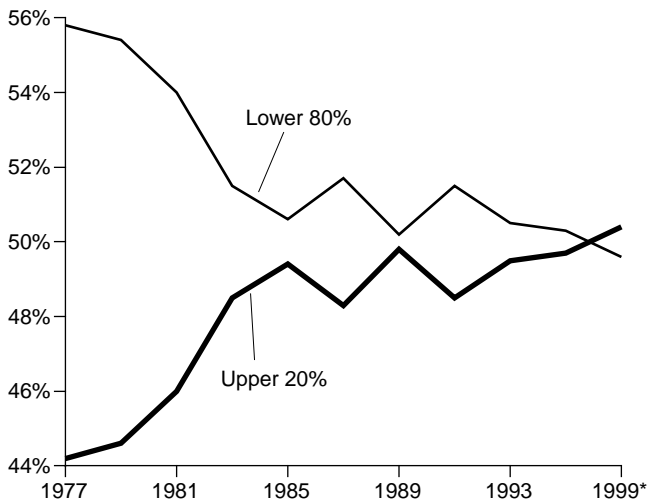
The chief populist rallying-cry on behalf of the repeated ruin of our nation’s economy, has been the argument that it has been government intervention per se which has caused the repeated ruin of the proverbial “little man.” This sophistry has been, ironically, a principal cause of the ruin of the conditions of life of the real-life “little man” in general, not the purely fictional “little man” of the populist’s Romantic, pagan-religious mythology. The curve showing the catastrophic collapse of the share of U.S. national income of the lower eighty percent of U.S. family-income brackets since the 1977 inauguration of the Brzezinski-Carter regime (**Figure 6**), is typical evidence of the fraudulent character of the radically

21. Our French friends do not like to hear this said, but it is true. As a second step (supplementing the influential follies of King Louis XVI’s wife) in the sabotage of the new French constitution for a U.S.A.-modelled, monarchical republic, was the organization of the hoax known as the July 14, 1789 “storming of the Bastille,” a hoax organized by joint efforts of two agents of influence of the British Foreign Office, the King’s rival the Duke of Orléans (“Philippe Égalité”), and former French Finance Minister, Lausanne’s Jacques Necker. The Duke had been a key political and freemasonic adversary of Benjamin Franklin in France. Necker had been, and was an asset of the British East India Company’s Lord Shelburne, and his daughter, the notorious Madame de Staël, was at the center of a gossip-circle controlling Queen Marie-Antoinette’s entourage from the inside. The storming of the Bastille was staged by Orléans as an election-campaign rally for the candidacy of Necker to become Prime Minister of France. The inhabitants of the Bastille had been the guards—whose killing prevented any among them from reporting how the incident had been pre-staged—and a collection of certified lunatics which the mob transported dutifully to the mental hospitals to which they had been awaiting transfer while in the Bastille. The whole affair was, like the French Terror, organized from London, by the head of the Foreign Office’s “secret committee,” the predecessor of MI6, the same Jeremy Bentham whose rise to power was the work of his patron Lord Shelburne. Shelburne was the relevant official of Barings bank, the bank of the British East India Company, and was also the chief paymaster of the British Parliament, and, allegedly, King George III, too. Poor Marie-Antoinette, the sister of Austria’s reformer Leopold II, had been the target of a Venetian network’s “Watergate”-style operation known as “the affair of the Queen’s necklace,” after which she, and her brother Joseph II, were never quite the same. As in this case, history, such as the history of France, would turn out much better, if silly myths, such as that of the Bastille, did not addle the minds of Frenchmen and others. To trace out the antecedents of this, one must look back to the interval 1782-1783, while Shelburne was Prime Minister of Britain. It was at that time, that the secret peace-intentions between the U.S.A. and Britain, on the one side, and Britain and France, on the other, were negotiated by Shelburne. It was the “free trade” conditions introduced by Shelburne, with the complicity of Physiocrat Turgot et al. on the French side, which had led to the French monarchy’s financial crisis of 1789. Shelburne asset Necker had been a key figure in this self-ruin of what had been the most powerful economy in Europe, that of Louis XVI’s France. An operation similar to that of Shelburne’s shoving “free trade” down the throat of France, was repeated, with great success, in the successful, extremely liberal ruin of the economy of, first, the Soviet Union, and then Russia, by the ideologues of the British Mont Pelerin Society. A similar success, has been the ruin of the U.S. economy by the “free trade” fanatics controlling the governments of Henry Kissinger, Zbigniew Brzezinski, et al.

FIGURE 6

America's Richest 20% Now Make More than the Other 80%

(percent)



*Projected

Sources: Congressional Budget Office; EIR.

right-wing populist argument against the constitutional obligation of the Federal government to promote the general welfare.

It should not be really astonishing to recall, that "Contract on America" fanatic, and radical populist right-winger Newt Gingrich, explained his doctrine of government as following the model of the most wild-eyed of the French revolutionaries of 1789-1794.²² Nor is it irrelevant to take note of the roles of Newt Gingrich, Al Gore, and Alvin Toffler, in Brzezinski-Carter-Presidency-era promotion of the ultra-ultra-right promotion of virtual outer-space flight, without benefit of space-ships, into a U.S. Revolution in Military Affairs. Al "You Know How Ah Gits When Ah Don't Git Mah Way" Gore was just as nasty a potential fascist dictator as his co-thinker and accomplice Newt Gingrich, but a floundering and bumbling political and scientific illiterate, when compared with the inherently more dangerous, cleverer, picaresque revolutionary populist, Gingrich.

One should be startled, but not really surprised to discover that these populist, or so-called "liberal" economic dogmas of opposition to the U.S. Constitution's general welfare clause, have, like Gingrich, Gramm, and so on, a record of being "right-wing," or turn out to be fascists. Such were the English followers of the Malthusian dogmas of Botero as Thomas

Hobbes, John Locke, and the pro-satanic Bernard Mandeville. Today, such apostles of liberal economic theology as the Mont Pelerin Society, Heritage Foundation, American Enterprise Institute, and others, base their doctrines of law in general, and economics in particular, on a Hobbesian principle of universal mortal conflict. This is a doctrine cohering with the doctrines and practices of those Roman imperial legions who have served as modern models for fascist states and military doctrines, from the first modern fascist, Napoleon Bonaparte, up to the present-day U.S. utopians of the "revolution in military affairs."

Those liberally fascist and kindred populists, stand upon a virtually Nietzschean form of such "each in war against all" dogmas, as their Nintendo game-player's sort of demand for "freedom" to do as they please, perhaps at Columbine High School, or elsewhere.

They stand upon their pervert's notion of the nature of the individual and of freedom, and often base their arguments on Tory-like attributions made to precedents of the law of our nation's original British adversary. They are, therefore, often embittered adversaries of even the mere memory of such hallmark American heroes as Cotton Mather, Alexander Hamilton, Thomas Paine, John Quincy Adams, Abraham Lincoln, Frederick Douglass, and Franklin Roosevelt. They tend to be sympathetic to the pro-satanic logic of Physiocrat François Quesnay's doctrine of *laissez-faire*, and, almost without exception, the pro-satanic doctrine of "free trade" which the owners of Smith, the British East India Company's slave-traders, upheld as Smith's plagiarism of Quesnay's doctrine.

Therefore, we are obliged to say that they interpret the putative name of "freedom" most liberally, or, to be plainer-spoken, most ferally.

In opposition to those radical empiricists, modern civilization is based on a principle of cooperation, known by such typical names as "the general welfare" or "the common good." As the fundamental law of our republic is stated within the Preamble of our Federal Constitution, in opposition to the right-wing, implicitly fascist Preamble of the Constitution of the Confederate States of America, the United States is prohibited from making any law, or conducting any related practice which is a violation of the principle of promoting the general welfare of all living persons and their posterity. Our Constitution is often violated, by the Congress and by the Federal Court, but there is no act of law in violation of that principle which should not be nullified on that constitutional account alone.

This notion of the general welfare is no mere slogan, no impulsive choice of rhetoric. There is a very deep principle involved: nothing of less consequence than the absolute distinction between the human species and the inferior, animal species. It is the point of difference in principle between mere Biosphere and the higher Noösphere.

This observation returns our attention here to what I have referenced here earlier, the two matters on which my work differs from that of Vernadsky: the social processes of cooper-

22. On Jan. 20, 1995, Speaker of the House Newt Gingrich equated himself with Robespierre and Danton, in a speech to the Republican National Committee in Washington, D.C. See Lyndon H. LaRouche, Jr., "Scalia and the Intent of Law," *EIR*, Jan. 1, 2001, p. 60.



"The typical, fraudulent defense of economic and political anarchy, of the hard-boiled, fanatical American populist, is the false charge, that it is government intervention 'from the top' which is the cause of all of the afflictions suffered by the underlings of society, such as themselves, at the bottom." Here, Rep. Newt Gingrich (R-Ga.) in 1995, who modelled himself on Danton and Robespierre.

ation by means of which society applies and develops the discovery of universal physical principles, and the Riemannian form of the manifold expressed as society's functional relationship to nature in general.

Cooperation As a Principle

The crux of the process of discovery of an experimentally validated universal physical principle, should be presented to a class of students as follows.

Since, as the earlier classes on this topic of discoveries of principles have shown, the power to generate a quality of hypothesis which is later proven experimentally to be a universal physical principle, is an act which occurs only within the bounds of the sovereign cognitive powers of the mind of the human individual: *How is that hypothesis communicated to other individuals?*

That is to emphasize that, although no known universal physical principle exists, to our knowledge, which has not been demonstrated conclusively by methods of experiment, no outside observer could detect the relevant creative-mental action actually occurring in the mind of the individual occupied with the process of generating that discovery. We can not detect the actually ongoing process of generating such a discovery, as it is occurring in the mind of the observed discoverer. We might, and should be able to observe that some kind of heightened degree of activity is occurring there, but we can neither see, hear, touch, nor smell, the relevant transformation in knowledge effected by that process itself.

As I have described the solution to that problem, in numer-

ous published locations, we are able to transmit knowledge of the process through a coordinated replication of the process of discovery within the sovereign cognitive powers of other persons.

This means that both have recognized, and are motivated by a relevant ontological paradox, which shows the existence of a suspected principle not already existing within proven knowledge. Both have accepted the obligation to generate an hypothesis which is a credible solution for the search for that principle. Both are committed to designing and applying the experimental methods needed to determine whether or not the hypothesis is valid.

In the case that all three aspects of the process of discovery become a shared experience in that manner and degree, the mind of one may not be able to "see" the relevant creative thought-processes of hypothesis-generation in the other's mind, but

they can recognize that the processes are congruent. They are able, thus, to re-create the creative processes in the mind of the other, through its replication within themselves.

All good teachers in schools rely on the kind of process I have just identified. I have often used the case of Archimedes as an example. How do you, as a teacher, prompt students to relive what went on inside the mind of Archimedes in making a certain discovery of universal physical principle? Thus, it has become customary to refer to all known acts of discovery of a universal principle, or something comparable, by referring to the name of the discoverer considered to be the original author of that contribution to all human knowledge. The names of many important discoverers, such as Plato, Aristarchus, Eratosthenes, Archimedes, Leonardo, Kepler, Leibniz, Gauss, and Riemann, are household names in the knowledge of any competently educated university freshman today.

Such names, are therefore more than mere words. They are names for moments of the student's own original re-experience of creative discoveries, as re-experiences replicated as living thoughts in the minds of the living. That student has experienced, within his or her own mind, a moment from inside the mind of the original discoverer; the student recognizes the mental "face" of that original discoverer, and calls that face by the name it bears.

In addition to named discoveries, there are many which we learn in a similar way, as by observing the principles exhibited in fashioning of ancient astronomical calendars, and so on. Mankind is not only a cognitive species, but it is the cognitive relations reaching back many generations of knowl-

edge, and reaching forward to many yet to come, which define us as human.

As I have emphasized in locations published earlier, the universal principles which have been transmitted from earlier generations to the present one, produce effects in human social behavior which are comparable to the effects of an improvement in the human genetic heritage. I have sometimes described such ideas as “super-genes,” in the sense that our biological heritage is not merely the biologically genetic one, but also those aspects of transmitted culture which have beneficial effects on human behavior. These are effects comparable to the genetic qualities of a higher species than the merely biologically human individual.

It is important to emphasize: The transmission of knowledge so generated, from the past, or as an experience shared with contemporaries, has the quality of force we associate otherwise with the notion of a qualitative, genetic improvement in a biological species. It is this mode of self-improvement of our species, through such knowledge, so developed, which sets the human species, biologically, absolutely apart from all lower species. We are not merely the traits inherited biologically through our parents. We are the products of our participation in the development of the culture we share, and to which we are rightly self-obliged to contribute.

Thus, cognitive qualities of task-oriented, mission-oriented cooperation, are the normally characteristic feature of our species, not Hobbesian conflict. Thus, a populist tends to be a person who has regressed, as if “genetically,” toward the condition of a sub-human species, a beast-like, predatory creature.

There are two aspects of civilized behavior, which address these matters most directly: science, and Classical (as opposed to, for example, Romantic) forms of artistic composition. The case of science has been indicated here already; the role of Classical forms of artistic composition, is generally not understood today, even among putative specialists. Therefore, let us concentrate on the matter of the relevance of Classical artistic composition, in determining crucial elements of effective cooperation around the application of ideas for progress. On that account we have the following.

The common principle which unifies true physical science with principles of Classical artistic composition, is *the cognitive principle of truthfulness*. In science, truth is defined as those hypotheses which have led to experimental proof of their efficiency as universal physical principles. For the same reason, *truthfulness*, as distinct from established truth, is associated with hypotheses which have been formulated on the basis of a mind trained in successful replication of acts of discovery of hypothesis, discoveries which have been substantiated experimentally as universal physical principles. In other words, the standard of *truth* is scientific certainty as to matters of principle. *Truthfulness* is the state of mind associated with methods adopted as the impact of successive successful discoveries of hypotheses likely to lead to proof of universal principle.

In Classical methods and works of artistic composition, the same criteria of truth and truthfulness apply to works which have the appearance of being fiction. Consider the following, relatively very simple illustration of the point.

Take the case of Hans Christian Andersen’s fable, “The Emperor’s New Suit of Clothes.” This is, on the one side, fiction. Yet, it is also truthful; in fact, at core it represents a conclusion which is in fact qualified as a universal principle on such sufficient experimental grounds as the recent downfall of the so-called “new economy” hoax, which also “had nothing on” in the end, so to speak. Many among the leading Classical Greek tragedies are truthful, on similar grounds. So, are the dramas of Shakespeare. Heinrich Schliemann’s discoveries proved the truthfulness of Homer’s epics. The leading dramas of Friedrich Schiller are, as both *Don Carlos* and *Wallenstein* illustrate this point, historically truthful, although the dramatic presentation of an entire expanse of history is compacted for the stage presentation by aid of fictions which are, in no case, elements which detract from the drama’s consistency with historical truth.

Take the cases of J.S. Bach, Wolfgang Mozart, and Beethoven, as examples of the expression of the Classical principle in musical composition. Since Classical music is very rarely known among members of the recent two generations of U.S. adults, this requires a bit more clarification, as follows.

Truth in Music

Modern scientific knowledge of musical composition dates from the Fifteenth-Century Renaissance in Italy and the Netherlands. This means, that although the notions of a science of musical composition existed in European civilization as early as such exemplars of relevant knowledge as Pythagoras and Plato, the Renaissance infused a systematic scientific spirit into musical practice. The ensuing development was set into motion, in stone, in the famous Cathedral of Florence, in which we have sculptures of singing boys who are provably singing in that natural, implicitly Platonic vocalization, universal to humanity, known as Florentine *bel canto*. The presently known, surviving fragments of the work of Leonardo da Vinci on the subject of music, provide sufficient basis for adducing his systematic treatment of a system of natural polyphony for the Italian’s use.²³

The next decisive development in the progress of Classical methods of musical composition and performance, occurred, chiefly, as development of well-tempered counterpoint by J.S. Bach. Bach’s counterpoint, contrary to the British hoaxsters Hermann Helmholtz and his accomplice Ellis, is based on *bel canto* tuning with Middle C set at 256 cycles, but with the value of C the only exact “tuning fork”

23. John Sigerson and Kathy Wolfe, eds., *A Manual on the Rudiments of Tuning and Registration*, Book I (Washington, D.C.: Schiller Institute, 1992); Schiller-Institut, *Handbuch der Grundlagen von Stimmung und Register*, Band I (Wiesbaden: Dr. Böttiger Verlags-GmbH, 1996); *Canto e Diapason* (Bergamo: Casa Musicale Edizione Carrara, 1996).



Given that nobody can see, touch, or hear the process of creative discovery, how can a teacher prompt the student to relive what went on inside the mind of the scientist who made such a discovery of universal physical principle?

value of a tone permitted in the well-tempered system.²⁴

The significance of Bach's revolution in composition, is that, for the first known time, an apparently complexly developed polyphonic work could be composed and performed in such a way that the entire composition, from the breath taken

24. Although Helmholtz was nominally German, his hoaxes were chiefly made to explicitly British specifications. Ellis was a rabid hoaxster, as well as a "white voice" racist, who pretended, at least, not to know the cultivated practice of transposition at the keyboard which instrumentalists used to tune performances to the natural ranges of the chorus of human voices. The Bach well-tempered system emphasizes not only the elementary impact of the principle of polyphonic development, rather than voices in parallel, but necessarily reflects the range of modalities which pre-Bach music had carried forward from down through the ages since ancient Greek times, or earlier. The singing voice, or the instrumental string and wind voices, must therefore adjust themselves to a slight shift in tone-value according to the direction of the motion, and other considerations in the vicinity in which the note is located. The keyboard artist must use sundry tricks to similar effect, if without actually resorting to the awkward undertaking of re-tuning the keyboard during mid-performance.

before the first note was sounded, until the resonant silence at the end, represented the communication of the development of a single, indivisible unity of a musical idea.²⁵ A deeper appreciation of this implication of Bach's work was later brought to the surface in musical Europe by Wolfgang Mozart's study of many Bach compositions at the weekly Vienna salon gatherings of Baron von Swieten. As in the setting of a Goethe poem, *Das Veilchen*, Mozart used Bach's influence on him, as shown earlier in his so-called Haydn quartets and the K. 475 keyboard Fantasy, to apply the implications of Bach's *A Musical Offering* to composition in general. The outcome of this is typified by the prolific Classical song-output and other vocal works of not only Mozart, but also such luminaries as Beethoven, Schubert, Schumann, and Brahms. The "Four Serious Songs," composed by Brahms near the end of his life, together with his exhaustively thorough, earlier Fourth Symphony, cap the triumph of Classical polyphony at the close of the century, over its irrationalist, Romantic plagiarists and other rivals.

There are several, interdependent qualities of truly Classical artistic composition, musical or other, which distinguish it from contrary views of art. These qualities serve as its indispensable instruments of truthfulness, as John Keats emphasized in his *Ode on a Grecian Urn*. The principal expression of all Classical art is the principal of truthful *irony*, a quality of irony whose peak expression is true *metaphor*.

Take as a model reference for this, the characteristic distinction which separates Classical Greek sculpture from the archaic. It captures life in mid-motion, and thus conveys a sense that it is life which is being portrayed. The function of the catenary, referenced above, is a point of comparison.

Unfortunately, in the illiterate age which grips the minds of most among the recent two generations of adults, there is virtually no understanding of the actual functions of irony, such as metaphor, in Classical artistic composition, musical or otherwise. It is for reason of that moral deficiency in generally practiced contemporary forms of culture, that society has tended to assume, ignorantly, the existence of an elementary incompatibility between physical science and artistic culture. The idea of "art for art's sake," or art for the sake of its sensual effects, is typical of the pathological state of mind about art spread in society today.

Not accidentally, the most common origin of the pathological belief in a separation of art from physical science, is the spread of a radical outgrowth of Aristotelean method known as empiricism. This method, which was introduced by the sometime lord of Venice Paolo Sarpi, was introduced to Sixteenth-Century England through such Sarpi assets as Sir Francis Bacon and through the mathematics pupil of Sarpi's household lackey Galileo, Thomas Hobbes. The influence of

25. Take as a relatively simple example of this, the C-minor fugue from Bach's first book of his *Well-Tempered Clavier*. Compare this to the elaboration of the principle is Bach's *A Musical Offering*, and with the essential argument permeating the posthumously published *The Art of the Fugue*.



Raphael's "The School of Athens." For the student trained in the Classical tradition, the names of the great thinkers portrayed in this painting become, not mere words, but names for moments of the student's own original re-experience of creative discoveries.

David Hume's apostle Immanuel Kant, and both the "Critical School" of German Romanticism, and the modern radical empiricism sometimes known as positivism, or logical positivism, are outgrowths of Sarpi's spread of the medieval superstition of William of Ockham. The influence of empiricism and its sundry offspring has been the chief source of incompetence and sheer irrationality about the subjects of science and art in modern European civilization since the accession of James I to the English throne.

The essential distinction of empiricism and its derivatives, is the denial of the existence of knowable truth. The Classical argument for this denial of truth is the central feature of the series of *Critiques* by Immanuel Kant, as typified by such variously acknowledged existentialist, avowed followers of Kant on this point, as truth-haters Karl Jaspers and Hannah Arendt. A related hostility to truth is met among materialists, such as avowedly orthodox Marxists. A summary description of the common basis in belief among empiricists and such Marxists points to the common root of their crucial error on this point. The common basis for their errant dogma, is the insistence that truth could lie only within the bounds of sense-certainty. The source of all related forms

of explicit, philosophical hatred of truth, is the proposition that knowledge is limited to what is to be learned from faith in sense-certainty.

I refer again to the allegory of Plato's Cave. Sense-certainty leads to confrontation with manifest ontological paradoxes. These paradoxes show us that what our senses report to our minds are merely the distorted shadows which a firelight might cast on the irregular surface-walls of a cave. The discovery of experimentally demonstrable universal physical principles, thus represents our knowledge of the real objects responsible for the apparent movements of the shadows. Thus, truth, as typified by discovery of such universal physical principles, is attained by focussing attention on the ambiguities expressed by those kinds of ontological paradoxes.

In literature, precisely such ambiguities are expressed in the forms of irony we associate with strictly Classical modes of composition in poetry, drama, and music. The working point is, that it is only through use of those Classical artistic forms of communication that we are able to accomplish what Shelley described in his famous essay "In Defence of Poetry," as "the power of imparting and receiving profound and impassioned conceptions respecting man and nature." Well-tem-



Luca della Robbia's sculpture of *bel canto* singers, in the Cathedral of Florence. The Renaissance infused a systematic scientific spirit into musical practice.

pered contrapuntal polyphony, in music, accomplishes that same purpose. Hence, the powerful effect achieved, from Mozart's *Das Veilchen* on, in setting poetry within the musical framework employed by Mozart, Schubert, Schumann, Brahms, et al.

The more obviously practical benefit of Classical artistic composition, is that it is the most efficient way of sharpening the powers of insight of the human mind, that in ways which are indispensable for attacking real-life problems arising in the form of ontological paradoxes. The most obvious link between that function of art and practical science, is great Classical drama such as that of Aeschylus, Shakespeare, and Schiller, especially those works which fall into the classification which Schiller identifies as "the sublime" (*Erhaben*). The method of the sublime is that of Plato's Socratic dialogues, which are, in turn, the model for defining the meaning and functions of irony in general and metaphor, in both physical science and in Classical forms of artistic composition.

To make clear the point respecting the principle of truth, consider the equivalence of magic to evil, as typified by the cases of the destructive effects, morally and intellectually, of Nintendo games, or wildly Romantic fantasies such as *The Lord of the Rings* and the escapist infantilism of the *Harry Potter* fantasy. These have their most stubbornly persisting, destructive effects among children and adolescents. However, they are typical, otherwise, of the Romanticism so energetically denounced by the great Classical poet Heinrich Heine. Indeed, the most destructive influence introduced to Nineteenth-Century German culture, including the roots of later Nazism, was the popularization of Romanticism

by the influence of Kant and the first of the modern fascist philosophers of statecraft, G.W.F. Hegel. The collaboration of Hegel and Savigny typifies the Romantic roots of the Nazi revolution's Carl Schmitt and Judge Roland Freisler.

The notion that a goal might be achieved through magic, is the essential premise, as by such forms of gnosticism as that of the Cathars, on which the propagation of evil depends. The belief in magic, is the denial of truth per se, especially when this is propagated among children of a suggestible age, such as by the Pokémon and Harry Potter cults. The spread of the "new violence" typified by the Columbine massacre, is only typical of this syndrome.

The distinction between Classical and Romantic modes in artistic composition and performance, rests

on precisely this point. What happened, for example, in the case of German and other early Nineteenth-Century art, to produce the popularity of Romanticism, was the substitution of a magical element of fantasy for truth-seeking expressions of irony. Thus, the immensely influential work of Classical poets and composers such as Goethe, Schiller, Mozart, Beethoven, Schubert, Heine, Schumann, and Brahms was mimicked and mocked by such as Berlioz, Liszt, and Wagner, by replacing the principle of truthfulness by flights into the magical domain of Madame de Staël-like erotic fantasy.

Contrary to today's popularized Romantic mythologies, there never was a Romantic phase of the development in Classical poetry and music. The great Nineteenth-Century Classical composers, from Beethoven through Brahms, existed in parallel, and in opposition to the Romantic resurrection of the tradition of that sterile trash of that forerunner of Hamburg curry-sausage known as Rameau. They mutilated Classical principles of composition as Coleridge sought to mutilate the reading of Shakespeare. The leading Nineteenth-Century Romantics did not update the preceding work of Beethoven and Schubert; they parodied it in the same sense that contemporary, ultra-decadent, post-modernist theatrical directors parody the Classical dramas which they mutilate for public edification.

The issue is truthfulness versus the moral perversion of what is known, alternately, as magic, or *gnosticism: the assertion of belief in the efficiency of asserted, but non-existent principles*.

The role of art in real life is that emphasized by Jena Professor of history Friedrich Schiller. As for the best Classi-

cal Greek tragedians, the superior standpoint of Plato, and of Shakespeare and Schiller in his other professional capacity as tragedian, the function of Classical drama is to assist audiences in adducing the underlying principle of real-life tragedy as history on the stage. The conclusion reached must be truthful, as the case of Schiller's own *Don Carlos* captures the essential truth about the role of Philip II's Spain in bringing about its own destruction through means consistent with its toleration of, and reliance on the policies of the Inquisition and the religious warfare of 1511-1648. So, Cervantes, with his *Don Quixote*, shows, in a similar, truthful manner, the root of the self-destruction embedded in the cultural habits of Sixteenth-Century "Carlist" Spain.

Thus, great Classical artistic composition, in music, in poetry, in drama, and otherwise, uses irony, as an expression of ontological paradox, to inspire a people to rise above the cultural purblindness of boorish, love-sick sense-certainty, to train the higher power of the mind to overcome the misleading lure of sense-certainty, and to uncover, in each case of life's experience, those principles by means of which to master the situation on behalf of the general welfare of past, present, and future humanity.

The Pursuit of a Sense of Mission

The combination of pursuit of discovery of universal physical principles, with the use of the same method of truthful insight into the principles of cooperative social relations, is the essential mission of a science of physical economy.

The unifying quality of great Classical artistic composition and physical science, is their combination of a sense of truthfulness with an impassioned sense of mission. In science, this is expressed by the physical scientist's healthy hostility to the fraudulent practice of those mathematicians who purport to prove or disprove universal physical principles by employing ivory-tower methods as if at the blackboard. As Kepler exemplifies the point, by referring to the principle of universal gravitation as a built-in *intention* of the Solar System, especially its Sun, all valid notions of universal physical principle are a view of a universe organized under the authority of a sense of *mission*.

In bad history, and bad art, success is measured, not by a standard of mission, but, rather, of adduced rules of the game, as if real history were merely a childish game, in which penalties were administered as punishment for violation of the currently adopted set of made-up rules. So, wretchedly bad economists adhere to a strictly gnostic view of the universe, when they insist, as Mandeville, Quesnay, and Adam Smith did, that adherence to the dogma of "free trade" is the precondition for the rewards of obedience to the rules by the nation of those lunatics worthy to be classified as true believers. Thus, do silly fools suggest that the danger is that "People might talk the economy into collapsing, by doubting its wont to prosper." So, lunatics insist that the U.S. economy will surely recover, if only there are sufficient fools to believe strongly enough in

that promised recovery.

In truth, the U.S. economy is currently collapsing, and will never recover in its present form.

The price of survival, is the eradication of those sets of rules which have brought about the present systemic collapse of the existing world system. This means the included abolition of virtually every change in axiomatic-like rules of the system introduced into U.S. law and related practice since 1966-1967, and returning to the proven, protectionist system developed over the course of the 1933-1964 process of general recovery from the preceding great world economic depression.

If we shall then survive, it will be because we, like Treasury Secretary Alexander Hamilton before us, prescribed and acted upon a truthful sense of national mission. That mission is the adoption of specific targets, looking toward a time about a half-century ahead when a future generation will reap the benefits we shall embed in the changes in policy we prescribe for the coming generation. Those changes in policy must be embedded as the protectionist sorts of regulations which efficiently channel the flows of wealth and activity into the needed directions. The pivot of all this, including a massive renewal and further development of our infrastructure, is creating both the conditions required for a revival of the work of the private entrepreneur, and inspiring the nation with the sense of mission which steers the efforts of the entrepreneur in the wanted direction.

At the present moment, the Bush Administration appears to be operating under the delusion, that its present approaches to a "stimulus package" will induce a war-economy-driven recovery echoing those of the march into World War II and the Truman military mobilization of his second term. Since the Bush Administration does not wish to give any implied credit to President Franklin Roosevelt and his policies, the present administration overlooks virtually all of those factors, of rigorous protectionist measures, which made Roosevelt's mobilization successful. Bailing out Bush campaign-contributors' financial-market holdings, is not the same thing as increasing the physical investment in skilled labor, scientists, technicians, capital, and supplies from vendors.

This requires the included replacement of the gnostic delusions widely taught and preached as "economics" in our universities and boardrooms today, by the adoption of a comprehension of economic processes based upon the conceptions of a science of physical economy. We must employ the tools of a science of physical economy, to devise the regulations which steer flows of financial capital into the channels which healthy physical economy requires. We must, therefore, above all else, uproot what is known, variously, as monetarism, or liberal economics, and send both into a suitable elegant form of retirement at some place like Peter Weiss's Charenton. Let us, thus, uproot the fantasy called a "consumer society," and resume our former greatness as a "producer society."