

On Academician Lvov's Warning What Is 'Primitive Accumulation'?

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Current developments are shattering wishful delusions about the world's economic situation. During the several few months since the inauguration of President George W. Bush, Jr., more and more among leading circles around the world are being impelled to recognize, that this planet as a whole is gripped by a systemic crisis, rather than, as they had wished, merely cyclical ones.

Since the financial crises of 1997, those leading circles have been wrestling with the increasing intensity of financial and other disasters, such as those currently erupting in Korea, Japan, Turkey, Argentina, and Brazil. That evidence should have already warned them, that the present crisis can not be mastered by treating it as either a periodic phenomenon, or the result of some isolated past mistakes in managing the system. As usual with such circles, they have had to learn such lessons the hard way, if, indeed, they are capable of learning them at all.

Now, with the most recent developments, apart from the typical U.S. dupes of mass-media brainwashing, it is being recognized, more and more, that although the world's economy itself could be revived, the present monetary and financial systems could not be saved. The immediate risk is, that this rescue action would be possible only if we act soon enough, to uproot that post-1971 monetary-financial system which made the terminal collapse of the world's present financial system inevitable.

We must not waste any more effort in the attempt to save the doomed system itself. We must conserve all our rapidly dwindling, remaining resources, while ensuring that the present financial and monetary system is shut down before it destroys the economy and civilization with it.

Worse, given the present level of the world's population, and the rate of collapse of the means of production needed to support that population, unless that post-1971 system is immediately scrapped and replaced, the attempt to maintain the presently bankrupt world

financial and monetary structures, would result in a generations-long new dark age for the planet generally.

The immediate danger is, that although the captains of finance and political power have all the evidence needed to show them that this crash is now ongoing, many among them would prefer to reign in Hell, than survive in a world which is not ruled by their doomed financial system. Their reaction to the crisis, is to plunge into flight forward, even if that means plunging the world into a global spread of warfare, or even a new dark age, that as a way of disrupting the efforts of others to build alternatives to the present global financial and monetary lunacy. They would cling to their sinking *Titanic*, even though they presently know it is sinking, rather than give up their seat at the captain's table.

Thus, for the moment, the world's situation is typified by the evidence that, for the present moment, the present U.S. administration, the British Commonwealth, and also the still marginally influential, if self-discredited, Democratic Leadership Council faction of the U.S. Democratic Party, are all still clinging to their hysterical refusal to accept the fact that there is no place in the living future of this planet for the kind of politics they practiced in 2000.¹

The sweeping changes needed at the present moment of global systemic crisis, are, chiefly, of two classes.

First, we must immediately put the world as a whole through emergency bankruptcy-reorganization, through measures which include extensive nullifications among existing masses of debt-obligation. Such measures are to be taken under the included authority of that general welfare principle embedded in the Preamble of the U.S. Federal Constitution.

These measures must be as drastic as may be required, not merely to save the continued orderly functioning of governments, necessary banking institutions, agriculture, and industry, that at levels required for the security of present nations and their present levels of population, and also to launch immediately a new wave of accelerating physical-economic growth. There is no hope for the U.S., and other nations, unless those seemingly drastic actions of reform are taken very soon.

To save the world's economy from the presently onrushing disaster, the protectionist form of the fixed-exchange-rate system of the 1945–1964 Bretton Woods System, including capital and financial controls, offers us an available, recently proven model of successful reform. All change from that successful, former system, to the present, failed, floating-exchange-rate system, has proven itself, over three decades, to have been an awful mistake. The only

¹ But for the immense popularity of President Bill Clinton, a most humiliating defeat of both the Presidential and Congressional slates, under the impact of the 2000 Gore-Lieberman ticket, would have shattered the continued existence of the Democratic Party. As Senator Edward Kennedy said, in a January 1995 address at the Washington, D.C. National Press Club, "the United States does not need two Republican parties."

practicable emergency action by governments, under present crisis-conditions, is to use the fact that the 1945–1964 Bretton Woods system worked, whereas its 1971–2001 successor has failed miserably, as the point of fact on which to base emergency measures today.

Second, we must institute certain reforms in the way in which the physical priorities of present and future economic policies are set. On this account, since it is the presently bankrupt world monetary and financial system which must be urgently replaced, we must focus much attention on those crucial, pathetic errors of the 1966–1981 interval, during which the most destructive of the axiomatic changes in physical-economic policies were set into motion by the U.K. and U.S.A., on the one side, and then echoed, with menacing global side-effects, within the Soviet system.

The subject of this report is the second of those two classes of emergency actions. I shall show, that our principal subject of policy-deliberation here, should be the phenomena sometimes associated with the economist's technical term "primitive accumulation."

The Lvov Warning

During the same June 29, 2001 hearings of the Economics Committee of the Russian State parliament, the Duma, at which my testimony was featured, Academician Dmitri S. Lvov warned against overlooking the long waves of physical-economic decadence which this planet has suffered over recent decades.² Later, in the brief remarks with which I was invited to close the testimony presented at that day's hearing, I emphasized the importance of his intervention, and implicitly committed myself to provide, soon, fuller elaboration of my own argument in support of his testimony. The subject is a matter of concern for the world at large. That elaboration is supplied in these pages.

Much has been said and written, during the past decade, of the decline in the Soviet economy, wreaked upon both the Soviet Union and, then upon post-Soviet Russia, the latter under the influence of the Anglo-American monetarist "carpet-baggers." So far, the great error has been, that too little attention has been given to the fact, that these developments afflicting Russia today, can not be competently assessed apart from the larger setting of the presently accelerating physical collapse of the world's economy as a whole.³ To correct that great error, we should situate Academician Lvov's June 29 warning, in the breadth and depth

² Dmitri Semyonovich Lvov is the Academician-Secretary of the Division of Economics of the Russian Academy of Sciences. For an English translation of his testimony, see *EIR*, July 20, 2001. [[Russian-language transcripts of all testimony at the June 29, 2001 Duma.](#)]

³ For a notable example of the hysterically silly view of Russia's present predicaments which is popular among some influential self-deluded U.S. strategic planners, see the childish tantrum of Jeffrey Taylor, "Russia Is Finished," *The Atlantic Monthly*, May 2001.

of the historical background for the combined, present crisis-situation enveloping not only Russia, but the world as a whole.

The crucial fact which no competent study of the present crisis could overlook, is that the presently onrushing, global financial collapse of the world's monetary and financial system, is chiefly the outcome of approximately thirty-five years of increasing interdependency among two distinct political-philosophical types of economic systems. The first of those, is the decadent, radically monetarist form of the IMF system, the form which emerged within the United Kingdom under the succession of, most notably, the Harold Wilson and Margaret Thatcher governments. This decadent form was echoed in the U.S.A., as the impact of the succession of the "Southern Strategy" candidacies of Republican President Richard Nixon and Democratic President Jimmy Carter.⁴ The second case, is that set of downward-leading trends of developments in the successive Soviet and Russian economies, a trend which appeared over the course of a parallel span of time.

Looking at this problem from the vantage-point of developments in Americas and Western Europe, over the 1945–2001 interval, we witness net progress in post-war physical-economic development during the 1945–1964 interval, for as long as the policies instituted by U.S. President Franklin Roosevelt continued to exert their waning influence on the policies of the U.S.A. and western continental Europe; but, the assassination of Roosevelt emulator President Kennedy, was soon followed by the onset of a period of overall collapse, inclusive of the interval 1967–2001 to date. During the latter interval, a parallel, net downward development, occurred in the Soviet and Comecon system. Those two, conflicting systems of that latter period, while each distinct from the other in many of their sundry axiomatic, or merely superficial characteristics, were nonetheless coupled to such a degree, that the short- to medium-term weakening of the long-term internal strength of the one, was reflected, ironically, in radiated effects, as a long-term weakening of the other.⁵

Look, for example, at the ironical combination of effects upon both western Europe and the U.S.A., of the 1990–2001 collapse of the savagely looted physical economies of the Comecon and its successors.

⁴ To understand the functional connection between the Nixon campaign's appeal to pro-Confederacy sentiment and the anti-growth commitments of the Nixon administration, one should read Stanley Ezrol's in-depth study of the origins and influence of the Nashville Agrarians, "Seduced from Victory: How the Lost Corpse Subverts the American Intellectual Tradition," *EIR*, August 3, 2001.

⁵ The two systems were not only coupled economically, through the world market. An increasing factor in the self-induced decay of the Comecon economies, was the increasing influence of British liberalism, especially the influence of Bertrand Russell *et al.*, over the decades beginning with the consolidation of the Khrushchev government. See note below: the increasing influence of Russell's followers through the King-Zuckerman International Institute for Applied Systems Analysis (IIASA), is typical.

During that 1990–2001 interval, the 1992–1998 interval most notably, the monetary systems of the U.S.A. and British Commonwealth jointly applied the same methods for looting of the territory of both the pre-1989 Soviet Union and such associated nations of the former Comecon as post-1989 Poland and Ukraine, which had been used by the post-1866 Wall Street “carpetbaggers,” in their looting of the territory of the short-lived Confederacy.

Through such “carpet-bagging” methods, the Anglo-American monetarists and their Russian compradors reaped vast physical wealth and financial income, by looting the economies of their victims. For a time, up to the close of the GKO-triggered, 1998 collapse of Wall Street's Long-Term Capital Management hedge-fund, this looting of the accumulated wealth of the former Comecon area, combined with the continued looting of both Central and South America and Africa, was a principal contributing factor, in temporarily propping-up Commonwealth and U.S.A. economies which were otherwise in a state of prolonged medium- to long-term physical-economic collapse.⁶

Consequently, the international financial and monetary collapse-crises of 1997–1998, reflected the principle, that *any parasite which depends for its existence upon sucking its prey into a state of exhaustion, will be ultimately brought down by its compulsion to weaken the vitality of its prey.* The triumphant predators of the 1989–2001 interval, the U.S.A. and British Commonwealth, are now being brought down by their feral exhaustion of the combined victims among nations of the Americas, Africa, Southeast and East Asia, and, also western continental Europe, Turkey, and the Balkans, that in addition to the looting of the former territories of the Comecon bloc.

Earlier, in such a manner, a succession of ancient Mesopotamian empires had each destroyed itself, in its turn, by its own parasitical triumphs. So, such practices, including the looting of the great and prosperous Abbasid Caliphate, by tax-farming usurers, produced there a desert from which the region has not recovered to the present day. So, the Roman Empire and Byzantine successors destroyed themselves, demographically and otherwise, from within, by the same policies which brought about the exhaustion of their chosen prey.⁷ Thus, the imperial, Anglo-American-controlled international monetary and financial systems of today, have doomed themselves, by their Romantics' presently continued imitations of the fallen empires of the past.⁸

⁶ The principal three other subsidies for the decadent U.S. dollar market, were the now precipitously collapsing 1995–2000 “new economy” bubble, the subsidy of the U.S. financial markets by the “yen carry trade,” and the presently hyperinflationary pumping of the U.S. financial markets through mechanisms of the U.S. Federal Reserve System.

⁷ The Malthusian demographic features of the imperial Code of Diocletian, are notable on this account.

⁸ I use the term “Romantic” in its strict, historically defined sense. It signifies the legacy of ancient Rome, in opposition to the Classical Greek. This includes those notions of law, such as those of Kant, Napoleon Bonaparte, Hegel, Savigny, and all the later fascists, which were based on the ancient Roman model of law,

In addition to these interactions among the various, interdependent systems of this planet, there is an included, crucial factor commonly underlying the presently ongoing global collapse: the large-scale introduction of neo-malthusian global policies, beginning with the influential 1963 Paris OECD education-policy report of Britain's Dr. Alexander King, and the subsequent founding of the Club of Rome and Laxenburg, Austria-based Institute for Applied Systems Analysis (IIASA) by the influence of the same Dr. King, Lord Solly Zuckerman, McGeorge Bundy, and Britain's Cambridge University-centered systems-analysis cabal.

This so-called neo-malthusian policy, sometimes called "environmentalism," amounts to nothing other than a form of economic suicide by slow poisoning, whose terminal effects are now being experienced approximately thirty-five years after the relevant changes were first introduced to the shaping of the policies of the U.S.A. and other governments.

The common, characteristic feature of this self-imposed, post-1967, internal economic collapse of the most powerful national economies of the 1945–1964 interval, has been the spread of the fungus of "systems analysis" throughout the policy-making of leading public and private institutions of today's world. "Systems analysis," is only a different variety of the same ideological practice, of "zero economic growth," expressed as neo-malthusianism.

The intrinsically "entropic" effects of applied systems analysis, is the characteristic, now global feature of the effects of the neo-malthusian ideological trends of the recent thirty-five years. The acceleration of the post-1989 self-destruction of the industrial economies, by aid of the introduction of the idiot-savant's delusion with "benchmarking," is merely one of the more outrageous of the many simple examples of the lunacy propagated in the name of "systems analysis."⁹

mathematics, physical science, and artistic culture which are rightly designed today as "Romantic," as opposed to "Classical." Typical of Romanticism, is the cult of "popular opinion," called, for the edification of the credulous, "democracy," which is a modern echo of the role of mob role, in the name of the orchestrated *vox populi* of "bread and circuses" notoriety.

⁹ The 1940s emergence of such expressions of "systems analysis" as Norbert Wiener's "information theory" (*Cybernetics*, 1948) and the related work of John von Neumann, was set into motion in the U.S. through partnership between the Josiah Macy, Jr. Foundation and the emerging RAND Corporation. These developments were a direct outgrowth of Bertrand Russell's 1938 founding, in concert with Chicago University's Robert Hutchins, of the so-called "Unification of the Sciences" project, which featured such figures as Karl Korsch, Rudolf Carnap, Margaret Mead, Gregory Bateson, *et al.* Wiener and von Neumann, had both been acolytes of Russell earlier, and shared the common distinction of being justly expelled from Göttingen University programs for acts of scientific incompetence. Essentially, systems analysis was a British project of the circles of Bertrand Russell and H.G. Wells, rather than being principally a U.S. concoction. It was during the "cultural-paradigm shift" associated with the mid-1960s "rock-drug-sex youth-counterculture," and the Nixon "Southern Strategy" campaign of 1966–68, that "systems analysis" established its hegemonic influence within that so-called "Baby Boomer" generation now occupying most topmost positions in government and other institutions of leading policy-shaping influence.

Considering Academician Lvov's testimony against the background of the world as a whole, it is clear that the division of each of the post-war world's dominant cultures into two matching periods, of successive periods of growth and decline, presents us with certain general characteristics which were common to both those otherwise distinct systems.

However, we must not commit the typical fallacy of composition, of concluding that it was the monetary and financial systems introduced after 1964, which ruined the world. No man dies of suicide; by definition, he dies of suicide only if he had succeeded in an attempted suicide. It was not really the prostitute who gave her customer the venereal disease; it was his decision to use that prostitute, which awarded him the infection. It was the physical-economic criteria which otherwise healthy modern societies imposed, arbitrarily, upon the design of their pre-existing financial and monetary systems, which has caused the decadence of both of what had been the world's dominant economic systems, that during the course of the recent thirty-odd years. When a scientist adopts a clearly anti-scientific mathematical dogma, and does so simply because that dogma has become fashionable, it is that professional who is morally responsible for the resulting catastrophe, not that mere dogma.

When a man acts immorally for the sake of acting in consistency with some mathematical dogma, it is the immorality of the man, not the dogma, which is to be blamed for the result. Like the assassin who pleads innocence, on grounds that, "It was nothing personal; I was just doing my job," the crime of the adherents of systems analysis, is that they chose to obey that fallacious dogma, even in immoral disregard for what they should have foreseen and known as the obviously cruel results of making that immoral choice. It is that crime which needs to be corrected.

Thus, the clear cause for the characteristic difference in physical-economic trends, between the 1945–1964 interval of net medium- to long-term growth, and the 1971–2001 interval of long-term collapse, is to be identified with two principal changes, beginning with the adoption of Richard Nixon's 1966–1968 "Southern Strategy," of more than thirty years ago: first, monetarist modes of physical looting of nations and their populations, and, secondly, the corruption of those cultures with deadly types of clearly mass-murderous *ideological intentions* concerning physical values, such as "neo-malthusianism," immoralities typified by so-called "systems analysis."

1. 'Primitive Accumulation'

Since each particular quality of social-political system, reacts somewhat differently to the same kind of experience, than do societies of other historically determined social-political characteristics, we must always examine the reactions within each, from study of both prevailing ideas and the preceding cultural history of each of those systems. We must then

examine the interaction of those societies in light of the interactions among the distinct cultural-historical specifics of each.

Such are the principles of the development of an applied science of history, which we should adduce from close study of the principles of Classical humanist modes of education. So, to understand relations between Russia and the world today, we must consider the succession of Czarist Russia, the Soviet system, and present-day Russia, in the light of both their historically evolving relations to the world at large, and Russia's unique, and strategically crucial characteristics as a specifically Eurasian nation.

So, I proceed here. Most immediately, any consideration of Russia and its external relations today, must take into account the legacy of the circumstances leading into the formation and internal evolution of the Soviet system, and the impact of that later shift to a radically monetarist, more or less "Thatcherite" form of economy, which was institutionalized in Russia about 1992. Any strategist who fails to take such relatively recent developments of the recent several generations into account, is likely to break his professional neck by his overlooking such evidence.

In the lexicon of modern Russia's history, including the legacy of Karl Marx and of such successful critics of Marx's error on the implications of this matter as Rosa Luxemburg and Soviet economist Yevgeny Preobrazhensky,¹⁰ it is fairly said, that "*primitive accumulation*" signifies the uncompensated conversion of previously existing resources into current consumption. In any valid use of that technical term, it signifies the drawing down, for current physical consumption, from either the store of nature, or previous forms of physical capital investments, or a combination of both, including those embodied in education and Classical forms of artistic culture. Implicitly, it signifies that, *for an economy to prosper, it must, sooner or later, replenish the physical economy, to compensate for that which has been "borrowed" from it as "primitive accumulation."* Net primitive accumulation signifies, that even during the medium term, the marginalization of the gross resources being depleted, will tend to result in a lowered performance of the physical economy, as performance is measurable in per-capita, per-square-kilometer, and demographic terms.

Therefore, for the long term, any sane government will wish to tax the using-up of natural resources in the degree needed, as a source of resources for the nation's reinvestment, either

¹⁰ Rosa Luxemburg, *The Accumulation of Capital* (New Haven: Yale University Press, 1951); Yevgeny Preobrazhensky, *Socialist Primitive Accumulation*. Preobrazhensky, not Leon Trotsky, was founder of the Left Opposition. His policies, adopted by Stalin for the first Five Year Plan, came into practice with the defeat of the Right Opposition then headed by Nikolai Bukharin. Preobrazhensky's notion of "primitive socialist accumulation" is an observable characteristic of Soviet economic development through and beyond the death of Josef Stalin. In a related matter, Rosa Luxemburg corrected both Marx and Lenin on their faulty analysis of Nineteenth-Century imperialism, by emphasizing the role of looting through international loans, rather than industrial development.

to replace what is being used up, or, to produce a substitute which is, functionally, a suitable replacement for it, or, to compensate for marginalization by an offsetting set of science-technology-driven increases in the net productive powers of labor.

Similarly, every functionally sane government will also, whether directly or indirectly, tax the economy in the amount needed to acquire the resources which ensure the maintenance or replacement of depleted, or depreciated capital improvements in both basic economic infrastructure and means of production of goods. Any government so reckless as not to do this, is condemning its nation to a long-term process of decay, and ultimate collapse through attrition, all through "primitive accumulation."¹¹

To resolve the issues implicitly raised by these observations, we must situate any discussion of Russia's economic policy-shaping, against the relevant historical backdrop: in terms of the way in which Russia reacts in such matters, which is to say, in terms of the historically defined contrast among *the most relevant three dominant, historical, social-economic systems of globally extended modern European civilization*: Soviet, American System (e.g., "Hamiltonian"), and that common rival of both of those, which is called either "monetarist" or "liberal."¹² The latter is that British system of "Adam Smith" *et al.*, which President Franklin Roosevelt denounced in warning Prime Minister Winston Churchill, that a post-war U.S. would not permit the world to be ruled again by what Roosevelt denounced as "British Eighteenth-Century methods." Unfortunately, Roosevelt died before he could carry out most of those changes.

Therefore, for this discussion of interactions among those three, historically "rival" systems, we must take into account another debatable, but nonetheless important topic of Marx's terminology, such as "fictitious capital (accumulation)." *By "fictitious accumulation," I emphasize the substitution of purely nominal financial, or equivalent notions of income, such as the increase in accounted volume of a leverage-driven financial real-estate holding, or the substitution of a common-stock price-bubble, for net growth in net physical output.* The recently collapsed, fraudulent "new economy" bubble of 1995–2000, is an example of this. The

¹¹ This may be accomplished by protectionist measures, such as those used to regulate trade and tariffs, by "investment tax credits," by preferential credit-policies, or other means: as long as those measures are designed and implemented efficiently.

¹² "Monetarist" and "liberal" are today's popularized synonyms for the Dutch and British monarchies' continuation of Venice's former role as a financier-oligarchical rule over an imperial maritime empire. The characteristic of the British system, is the introduction of neo-Ockhamite empiricism to England by Paolo Sarpi. Other most notable Venetian influences embodied within modern English and British ideology, include Francesco Zorzi, Giovanni Botero, Antonio Conti, and the founder of modern Malthusianism, Giammaria Ortes. Typical of the British clones of Venetian influence, are not only the Cardinal Pole and Thomas Cromwell of Zorzi's sojourn in London, but clones of Botero and Sarpi such as Francis Bacon and Thomas Hobbes, and products of the influence of Conti and Ortes, such as Jeremy Bentham and his British East India Company Haileybury cabal.

present, explosive U.S. real estate-mortgage bubble, is a deadly example of this. To treat the scope of the subject-matter implicitly addressed by my opening remarks here, we must also make reference to the work of two among the most notable figures of Soviet Russia's 1918–1945 interval, the “long wave” economist Nikolai Kondratieff, and the founder of biogeochemistry, V.I. Vernadsky.¹³

To that end, I shall focus on the exemplary case of policy-shaping axioms underlying the post-1966–1971, long wave of economic and moral decadence caused by the looting of previous capital investments in U.S. basic economic infrastructure and productive capacity of the U.S. economy. I shall then view the more general application of the relationship between global effects of primitive accumulation and the systemic, rather than merely cyclical aspects of the presently onrushing physical collapse of the economy of the planet as a whole.

In this connection, I shall, once again, take into account the current political relevance of Vernadsky's work, for addressing the subject of the role of primitive accumulation, as that subject is to be seen within the bounds of the science of physical economy. Out of respect for the relevance of some of the discussion of the role of “energy” in Vernadsky's work, which followed my June 28th address to Moscow's Lebedev Institute, on the subject of the immediate relevance of Vernadsky's work, I shall situate that discussion at the Institute within the specific framework of Russia's history. I begin now with a relevant summary of my personal relationship to Vernadsky's concept of the noösphere.¹⁴

My Agreement and Differences with Vernadsky's Definition of the Noösphere

My own original discoveries in the science of physical economy, were made, during the interval 1948–1951, as products of my intention to refute Professor Norbert Wiener's radically positivist misdefinition of “information.”¹⁵ At that time, I proceeded with the same attacks against Wiener's argument, which I had adopted, years earlier, in my adolescence, in defending Gottfried Leibniz's notion of a monadology against Immanuel Kant's ***Critique of Pure Reason***. It should be apparent, and thus taken into account, in my remarks here today, that my views on the opposing methods of Leibniz and Kant, as located centrally in the issue

¹³ The dating references the 1945 date of Vernadsky's death.

¹⁴ Recent articles in *EIR* by this author that discuss Vernadsky, include: “A Lawless U.S.A. Today: Faith, Hope, and *Agapē!*” June 1, 2001; and “How to Define a Physical-Economic Collapse: Marat, De Sade and ‘Greenspin,’ ” June 29, 2001.

¹⁵ Norbert Wiener, *Cybernetics* (New York: John Wiley, 1948), and *The Human Use of Human Beings; Cybernetics and Society* (Boston: Houghton Mifflin, 1954); Wiener's misuse of the term “information,” was already in circulation under the rubric of “Wiener-Shannon information theory.” Wiener's argument was identical to that of his fellow-Russell acolyte's, John von Neumann's, 1938 definition of economic “systems analysis,” the latter a scheme derived from a mathematical theory of games of chance played within the bounds of an implicitly closed (“completed”) system.

of the monadology, have continued to be the point of reference for all of my intellectual development and related work since adolescence.

Therefore, from the start of that refutation of Wiener's hoax, I was already persuaded, that the effort to trace the origin of life from within axiomatically abiotic processes, was obviously an epistemological absurdity.¹⁶ However, partly because of what I recognized as an included flaw in the way in which Vernadsky locates the impact of scientific discovery on man's relationship to national economy, his work on this subject of the noösphere had no functional role within the way in which I originally developed my own discoveries during those early years of my work.¹⁷

Also, at that point, in 1952, I had reached my conclusions in the course of refuting Wiener's and von Neumann's work on matters of economic processes; at which point I was about to adopt the habilitation dissertation of B. Riemann as the only competent standard from which to define the internal characteristics of what Vernadsky identifies as the noösphere. Thus, while, in later years, I have consistently praised Vernadsky's beautiful application of the methods of experimental physical science, I also emphasize, that the relationship of the individual to nature, through the historical social process, can not be competently addressed in any other way than from the standpoint of adopting a Riemannian notion of an *anti-*

¹⁶ Admittedly, my knowledge of Vernadsky's work relied, at that time, entirely on secondary sources; but, I was later able to confirm that those opinions of his work were correct.

¹⁷ During that 1948–1951 interval, I had given much attention to the work of a series of investigators including Chicago University's Nicolas Rashevsky's work on mathematical biophysics, and later also Oparin. Thus, somewhat later, I was made happily aware, although then through secondary sources, that Vernadsky had understood the problem of defining living processes, as Rashevsky and many others, including Professor Schrödinger, had not. I therefore came to consider Vernadsky the individual intellect, qua individual, who viewed the axiomatic distinctions of life and cognition in terms similar to my own views. However, on the most crucial issue of a Leibnizian science of physical economy, I was obliged to exclude Vernadsky's oversimplified view of the function of cognition (*noësis*) from my approach. That is to emphasize, that Vernadsky's view of the noösphere, by emphasizing a direct relationship of the individual creative intellect to nature, committed a fallacy of composition, ignoring the existence of the social processes through which those noetic (cognitive) processes actually function to bring about qualitative advances within a physical economy. It was the central feature of my discoveries of the 1948–51 interval, that these cognitive processes function in terms of those types of experimentally verifiable universal physical principles associated with Classical forms of artistic composition, as distinct from and opposed to the Romantic, Modernist, etc. misconceptions of culture. The actual processes by which discoveries of principles are developed, and given social currency, can be represented only the application of the anti-Euclidean geometry of Bernhard Riemann to the combined domains of abiotic, biotic, and cognitive phenomena. The included result of this is a different definition of the notion of energy than is accepted by the contemporary reductionist traditions. These differences came up, in the matter of energy in economic processes, in my public discussion with my friend Pobisk Kuznetsov, in 1994, and, again, in the recent meeting at the Lebedev Institute, where I identified my objections to the attempt to introduce a reductionist notion of energy, to the functions of human cognitive impact on physical economy, which Vernadsky did not do. However, had Vernadsky actually developed a mastery of the implications of anti-Euclidean Riemannian geometry, I have no doubt he would have corrected himself to reach the correct general conclusion.

Euclidean physical geometry, as a standard of reference for defining the social process in which the individual's mind's functionally efficient relationship to nature is actually situated.¹⁸

That is to emphasize, that the individual discoverer acts on nature, not as an isolable individuality, but only through acting upon the social process in which he or she is situated.¹⁹ It is this social aspect of the matter, an aspect typified by the proper function of education, which demands the approach offered by Riemannian physical geometry. It was on this pivotal point that my work has been based, during the 1948–1953 interval of my initial series of discoveries and related developments, as now. It was the approach, which led me to adopt Riemann's geometry as the location in which to situate my own discoveries.

Thus, although I recognize and admire greatly Vernadsky's development of his concept of the noösphere, his conception of the individual person's cognitive relationship to the biosphere was flawed, to the degree it was axiomatically a greatly oversimplified representation of the relationship between the individual discoverer and the realization of the benefit of the discovery; it does not correspond to my own image of the characteristic, determining social processes of what he termed the noösphere, as I have developed my own view from a different starting-point, through my own discoveries in physical economy.²⁰ The crucial importance of that distinction should become clearer in the course of this present report.

Later, however, in my writing a 1973 letter which founded the scientific institution subsequently known as the Fusion Energy Foundation, I emphasized that my associates must subsume Vernadsky's concept of the noösphere-biosphere underneath my own original contributions to the development of the science of physical economy. Since that time, the institutions which I represent, have always adhered to that specific view of the crucial place of Vernadsky's work within the framework provided by a science of physical economy.

More recently, since my Berlin address of October 12, 1988, this standpoint finds greatly increased practical importance, in the setting of the task-orientation now defined by the Eurasian Land-Bridge program, in which qualitative and large-scale changes in the

¹⁸ By the convention introduced by Carl Gauss's teacher, Abraham Kästner, the important distinction between an *anti-Euclidean*, and a merely *non-Euclidean* geometry, is that a non-Euclidean geometry alters the set of postulates of an Euclidean geometry, whereas an anti-Euclidean overturns the system of definitions and axioms, as Riemann does; that, from the standpoint of both formal-mathematical paradoxes, and also physical-experimental discoveries.

¹⁹ See the discussion of this in the following chapter of this report.

²⁰ The importance which Vernadsky attached to education belies his emphasis on the individual relationship to nature, in his defining the noösphere. His apparent inconsistency on this account, is to be blamed on certain widely popularized delusions, even within the physics community generally, about the social processes associated with discovery of universal physical principles. These are delusions chiefly rooted in the virtually religious hegemony of reductionist mathematics in today's teaching of physical science. In the case of Vernadsky, I think I am on sound ground in thinking that had he come to view the work of Riemann as being an anti-Euclidean geometry, as I did, he would have tended to correct his views accordingly.

functioning of the biosphere are elevated to crucial importance.²¹ Here, Vernadsky's work blossoms into its fuller importance for the science and practice of physical economy, as also in restoring a presently much-needed, non-reductionist approach to biological science in a more general way.

The central feature, and starting-point of my attack on the obvious fraud perpetrated by Wiener (and, also, such lunatic concoctions by John von Neumann as "systems analysis" and "artificial intelligence"), was, as I have already noted, my earlier adherence, since mid-adolescence, to the standpoint of Leibniz's monadology, in opposition to the virtually brain-dead reductionism of Immanuel Kant's celebrated *Critiques*.²² Wiener's argument carried the legacies of both British empiricism and Nineteenth-Century neo-Kantian Romanticism to an extreme. The challenge to me, was to define the method by which to demonstrate, experimentally, from the standpoint of a science of physical economy, that the generation of valid new discoveries of universal physical principle, was a provable hypothesis. The study of the role of applied discoveries of scientific and technological progress, in generating increases of the per-capita productive powers of labor, offered the obvious approach to meeting that challenge.

The core of my argument against Wiener's "information theory," is elementary. As Vernadsky has made a similar argument, the issue is whether or not the human species has the manifest ability to increase willfully its potential relative population-density, as no other species can willfully accomplish such a result. This effect is shown to occur only through the application of experimentally validatable discoveries of universal physical principles to social practice. These discoveries can not be derived by the statistical methods associated with the influence of Ernst Mach, or that of Bertrand Russell and such Russell acolytes as Wiener and von Neumann.

²¹ In a televised address that date, I forecast the imminent collapse of the Comecon system, likely to erupt first in Poland, with the resulting reunification of Germany, with Berlin designated to become once again its capital. In that address, I summarized my proposal for new initiatives for economic cooperation with the Comecon members. My later, 1989, proposal for a European Productive Triangle (see *Das 'Produktive Dreieck' Paris-Berlin-Wien: Ein europäisches Wirtschaftswunder als Motor für die Weltwirtschaft* [Wiesbaden: EIR Nachrichtenagentur GmbH, 1990]) and the extension of that, beginning 1992, as the proposal for a Eurasian Land-Bridge development (see *The Eurasian Land-Bridge: The 'New Silk Road'—Locomotive for Worldwide Economic Development* [Washington, D.C.: EIR News Service Inc., January 1997]), were a continuation of the Berlin statement of Oct. 12, 1988. See also, "Productive Triangle to Eurasian Land-Bridge," *EIR*, July 27, 2001.

²² Kant's hoaxes were plainly echoes of the reductionist fanatic Leonhard Euler's attack on the monadology, the same standpoint from which the "connect-the-dots" hoax of the "Cauchy fraction" was imposed upon Leibniz's calculus.

What Is Scientific Method?

The disastrous effects of all application of the dogmas of “systems analysis” to real economies, originate in the intrinsically anti-scientific, and actually schizophrenic assumptions, from which that dogma is derived.²³ The essentially insane assumption underlying systems analysis, is, that the principles of physical processes can be adduced from within the bounds of an implicitly arithmetic, aprioristic system of that type associated with Bertrand Russell's control over the production of the Russell-Whitehead *Principia Mathematica*. The combined influence of Wiener and von Neumann, as expressed in the founding of the RAND Corporation and promotion of systems analysis, is a leading example of that specific insanity. Kurt Gödel's devastating 1930 refutation of the doctrine of Russell, Gödel's proof, is not the best refutation of systems analysis; but it is a devastatingly conclusive, formal type of proof with special historical relevance.²⁴

The pivotal symptom of such specifically schizophrenic delusions in the name of science, is the exclusion of the principle of physical-scientific discovery of universal principles, as such principles are excluded, deductively, from the aprioristic, axiomatically “complete systems,” as practiced by such cults as those of Wiener and von Neumann. On the subject of primitive accumulation, the functionally crucial element of what is actually clinical psychosis within the methods of systems analysis, is its hysterical denial of the act of an experimentally validatable discovery of a universal physical principle. This is, for example, expressed as the hateful hysteria of Bertrand Russell against the memory and influence of the work of Leibniz, Gauss, Wilhelm Weber, Riemann, *et al.*, and also expressed by all of those allied with Russell, as the followers of the radically empiricist Ernst Mach expressed a related kind of hatred against Max Planck.

²³ My use of “schizophrenia” here, is not symbolic, but scientifically precise. It signifies, in the instance of Russell, a universe in which only his fantasy will be considered as the basis for action, even if that is contrary to all physical evidence. Like the Bible fundamentalist who acts on the real world, on the basis of his anticipation of a “rapture unleashed by a new battle of Armageddon,” both the movements of the schizophrenic's hands and mouth, and his interpretation of actually perceived events, are controlled by his unworldly fantasy, but the effect of those movements is the consequence of such actions in the real world whose functional existence the deranged mind denies. Religious warfare, such as that which almost destroyed Europe during the A.D. 1511–1648 interval, is an example of such schizophrenic mental states. On the subject of the propriety of my defining such aberrations among mathematicians as specifically psychopathological phenomena, see my discussion of the functional definition of “human nature,” in the closing portion of this present report.

²⁴ Kurt Gödel, “On Formally Undecidable Propositions of *Principia Mathematica* and Related Systems” and *Discussion on Providing a Foundation for Mathematics*, *Collected Works*, Vol. I (New York: Oxford University Press, 1986). Notable, are the vicious attacks on Gödel from the factional allies of Russell at both the Princeton Institute and the circles of Russell's factional allies at the University of Chicago. Most notably, the creation of the RAND Corporation, and the associated spread of “information theory” and “systems analysis,” have been direct offshoots of both the H.G. Wells-Russell alliance around Wells' 1938 *The Open Conspiracy*, and the 1938 launching of Unification of the Sciences cult by Russell, Hutchins, *et al.* The RLE at Massachusetts Institute of Technology (MIT), has been a hot-bed of systems-analysis kookery since the end of World War II.

Since all durable physical-economic progress of society, depends inclusively, but also absolutely, upon such discoveries of universal physical principle, the attempt to eliminate the factor of such discoveries from the shaping of economic policy, must lead toward an entropic decline, and, ultimately, disintegration of any society which adopts the currently epidemic form of mental illness expressed by systems analysis and its correlatives.

Therefore, for precisely that reason, all competent economic policy today, begins, in current practice, from a refutation and rejection of systems analysis and its correlatives.²⁵ This means, that we must begin all serious study of the problems of today's world economy, from the standpoint of defining and affirming the principle of discovery and socially determined application of experimentally validated discoveries of universal physical principle.

In summary, that definition is made as follows.

In the successful design of those experiments which lead to proof of a newly discovered universal physical principle, we are able to identify features of that design which are unique for the principle being tested in that choice of medium. Those features of successful such proof-of-principle experiments, are usefully identified as "technologies." It is necessary to call these "technologies," to distinguish such derivatives of discovery of principles, from the related universal physical principles themselves. It is the application of those technologies to the design of productive and related practice, which is the immediate expression of the way in which the discovery of a universal physical principle generates the physical potential for a willful increase in the potential relative population-density of the human species.

The relevant definition of a universal physical principle, is derived from the Socratic method upon which Nicholas of Cusa founded modern European experimental physical science, as in his *De Docta Ignorantia* and later writings on this matter. The Classically Platonic method of *docta ignorantia*, which is otherwise described in science as Cusa's "the coincidence of opposites" and Leibniz's "*Analysis Situs*," leads to the Classical model to be recognized in the original and unique discovery of the principle of universal gravitation by avowed Cusa follower Johannes Kepler. The latter is the work which was the actual founding

²⁵ What is otherwise currently generally accepted accounting practice, becomes a form of the same specific kind of insanity as systems analysis, when the accountant crosses over from competent accounting as a study of a well-defined class of special legal fictions, into believing that his methods represent the way in which wealth is generated in society. Typical of such passing over into delusions about accounting methods, is the case of apprentice-accountant Milton Friedman's adoption of the induced delusion that he was an economist. Accountant-turned-bad Robert McNamara, who presided over the downturn in quality of production management at the Ford Motor Company, and then went on from there to ruin the U.S. Department of Defense in a similar fashion, is an example of the effects of imposing such unworldly fantasies about accounting as a substitute for reality, upon real processes. The manner in which post-1971 financial bubbles were developed on Wall Street and elsewhere, like the 1923 Weimar hyperinflation, are typical of that quality of mental illness as a mass phenomenon, which may result from treating financial accounting constructs as substitutes for the real world.

of a modern mathematical physics which is both implicitly comprehensive and a competent impulse in its intended direction.

That is to say, that *all typical discoveries of universal physical principles, occur as solutions to those well-defined paradoxes which overturn previously established axiomatic assumptions respecting the principles governing the universe.* The false assumptions overturned, are either explicitly false claims, or appear in the form of omission of some universal principle which must be taken into account; or, often, this has involved a combination of both types of erroneous assumptions.

In the language of that modern experimental physical science defined by such explicit followers of Cusa as Luca Pacioli, Leonardo da Vinci, Kepler, and by the uniquely original discovery of the calculus by Leibniz, *the typical method for defining such a paradox, and then solving it, is to state the mutually contradictory elements of the experimental evidence within the terms of an axiomatically geometrical mathematical physics representing the assumptions within which that paradoxical evidence is situated for study.*

Fermat's definition of a pathway of quickest time, as opposed to shortest distance, is perhaps the simplest, best choice of standard Classical pedagogical model for such constructions. Kepler's proof, that the future position and velocity of Mars in its orbit at some chosen time, could not be derived by the statistical methods of Copernicus, Brahe, *et al.*, is another best choice for a typical standard in pedagogy.²⁶ From such discoveries as these of Kepler and Fermat, we have the modern notion of the discovery and proof of a universal physical principle, that from the starting-point provided by a well-defined ontological paradox. Leibniz, and his followers, used the term "*Analysis Situs*" as typifying this class of paradoxes. These principles were identified by Kepler, in his discovery of universal gravitation, as the expression of a universal *intention* existing outside the previously established assumptions of any closed system in mathematical physics.

For the purposes of the topic of primitive accumulation, compare Kepler's use of scientific method with that of Vernadsky.

By application of those same principles of discovery in experimental physical science, Vernadsky defined the evidence of a universal principle of life. This signified life as a principle which could not have come into existence through a development within the domain of axiomatically abiotic processes. He used the same method to argue that *noësis* (cognition) could not have come into existence within the domain of non-human forms of biotic processes.

²⁶ My associate, Bruce Director, has summarized the rudiments of this argument in terms which are both rigorous and suited for the layman, in an updated version of his presentation at a February conference. See videotape, "The Science of Kepler and Fermat," EIRVI-2001-12, EIR News Service, 2001.

Thus, for Vernadsky, as for me, and for relevant others, *the known universe is composed of three, multiply-connected, but distinct, experimentally defined categories of universal physical principles: abiotic, biotic, and cognitive (noëtic)*. Proceeding in that order, the epistemological implication of *Vernadsky's experimental conception of the noösphere, is, in brief, that none of the respectively higher two categories of universal physical principle can be derived from either of the lower ones*; however, it also follows, that the universe as a whole is so multiply-interconnected, that no lawful process in the universe exists functionally as independent of the efficient presence, as a universal physical principle, of all three categories of principle.

The Issue of Entropy

Vernadsky's discoveries implicitly demolish what has become widely accepted as a pro-paganist variety of modern religious doctrine on the subject of thermodynamics. Reconsider the foregoing identification of scientific method in light of the simplistic axiomatic assumptions on this subject which were introduced arbitrarily by Clausius, Grassmann, Kelvin, Boltzmann, *et al.*, as also by Wiener *et al.*

These referenced founders of the more popular modern classroom doctrine of universal entropy, premised all of their work on the subject of heat, on a hoax spread through the influence of an anti-Leibniz fanatic, Leonhard Euler, who attempted to eliminate the actual content of the Leibniz differential from the calculus.²⁷ At that time, 1761, Euler was among the followers of the then-deceased (1749), Paris-based Abbot Antonio Conti, whose Europe-wide network of salons, including the cabal of Maupertuis and Euler at Berlin, had created, as if out of mud, the mythical apotheosis of both Voltaire and Newton. The work of Clausius *et al.*, providing a sophistry on the subject of Sadi Carnot's work, was then arbitrarily extrapolated by Clausius *et al.*, chiefly on the authority of the mathematical assumptions inhering axiomatically in Euler's fraudulent, reductionist representation of the Leibniz

²⁷ Leonhard Euler, *Letters of Euler on Different Subjects in Natural Philosophy, Addressed to a German Princess* (1761), David Brewster, ed. (New York: Harper & Brothers, 1840). Euler and Maupertuis, were caught out and exposed as hoaxsters on the initiative of the collaborators Gotthold Lessing and Moses Mendelssohn. However, the fraud, of linearization of the differential, perpetrated by Euler, was perpetuated by his follower Lagrange, and by Laplace and Cauchy. With the successful intervention of Britain's Duke of Wellington to restore London's Bourbon puppet to the throne of France, the Ecole Polytechnique was taken over by the Euler-Lagrange-d'Alembert-Laplace-Cauchy cabal. The German opponents of Alexander von Humboldt, Gauss, Wilhelm Weber, Dirichlet, and Riemann, the German reductionist school of Clausius, Grassmann, Helmholtz, *et al.*, were a by-product of these sordid political developments in France. In the course of what became the founding meeting of the scientific society known as the Fusion Energy Foundation, I proposed, on the basis of Leibniz's conception of non-linearity in the infinitesimally small, that the effort to block research into controlled thermonuclear fusion on the pretext of "Coulomb forces," was by no means self-evident. Immediately after that meeting, Chicago University's Professor Robert Moon met with me to lay out the evidence on the Ampère angular-force principle, which showed, on the basis of the experimental proof developed by Wilhelm Weber, that "Coulomb forces" must be necessarily reversed in the infinitesimally small.

calculus. In this way, Clausius, Grassmann, *et al.*, thus introduced the foundations for what became the doctrine of universal entropy.

Thus, we have notions associated with the so-called Three Laws of Thermodynamics, and such by-products of that as both the famous work of Ludwig Boltzmann and of Wiener.

As outcome of that, we have the effort of a student of Boltzmann's, Erwin Schrödinger, to degrade the anomalous experimental phenomena of life, to a matter of "aperiodic crystals." The hoax of "information theory," as perpetrated by Bertrand Russell acolyte Norbert Wiener, was directly a product of this wild-eyed doctrine of "thermodynamics." The work of Russell acolyte John von Neumann, as on so-called "random theory," systems analysis, and "artificial intelligence," is among the schizophrenic by-products of that same Delphic heritage.

The inevitable consequence of those gnostics' hoaxes in the name of science, is those presently popular fantasies of molecular biology, which insist that living processes are evolutionary outgrowths of abiotic processes; and, as system analysis' von Neumann insisted, that eventually, computing machinery based on "information theory," will create robots which degrade man into the status of a more or less obsolete species.

The pervasive consequence of the spread of such malicious fantasies as those, is the widespread axiomatic presumption, that the existence of a substance called "energy," and these assumptions of reductionist thermodynamics, are codependent realities. Hence, we have, especially since Wiener's 1948 *Cybernetics*, certain widespread delusions respecting the existence of phenomena described as negative entropy ("negentropy") within a universe in which entropy is falsely assumed to be universally pervasive.²⁸

For such reasons, since approximately the time of his death in 1945, the work of Vernadsky has been regarded by some, such as some among the RAND Corporation circles of the late 1940s, as the principal scientific threat to the current, post-modernist version of the dogma of universal entropy.²⁹ The following considerations are the most immediately relevant ones.

²⁸ Contrary to delusions popular in many relevant classroom circles, there is no experimental proof of such constructs as "cybernetics." They are the product of the superimposition of arbitrary axiomatic, mathematical assumptions upon what the devotees of those views impose upon the evidence which they present as supposed proof. Such tricks as those belong not to the domain of science, but of stage magic.

²⁹ Typical of the post-modernist character of that trend, is the development of so-called "science fiction" in the U.S. The writers of that stuff were not merely fantasists, but were dominated by a very specific ideology, an ideology built around a revival of the same "Occam's Razor" dogma of that medieval gnostic, William of Ockham, upon whom Paolo Sarpi premised his founding of the English empiricism of Francis Bacon, Thomas Hobbes, *et al.* Those science-fiction writers "softened the brains" of various suggestible strata of the post-war population, thus creating a market for such fantasies as "artificial intelligence." The popularity of the Hollywood "Star Trek" series typifies the spread of such sickening ideology.

If the experimental evidence, such as that cited by him, shows that life is a principle of universal physical action, which exists independently of the principled characteristics of abiotic processes, what happens, then, to the claims for a universality of reductionist thermodynamic notions of energy? To similar effect, as I have demonstrated, cognition is efficiently a universal physical principle found only among human beings. If the principle of cognition is demonstrated to be a physically efficient generator of anti-entropic organization in man's relationship to the universe, what, and where, then, is "energy"?

In the light of the latter classes of evidence, reason will not tolerate that epistemologically absurd presumption, that these principles, of abiotic, biotic, and cognitive action, do not co-exist equally, as if from any assumed "beginning" of the universe. Only the voice of mental illness could propose that anything exists efficiently as a universe, "prior to," or "outside" the multiply-connected array of these three categories of universal physical principles. Those considerations oblige us to consider the following implications of such view for mathematical physics in general.

If, then, each experimentally validated discovery of a universal physical principle, as what Kepler identified, in his *The New Astronomy*, as an *intention* of the universe, is, functionally, an independent physical dimension of the universe, *what kind of geometry must be adopted as the basis for a competent mathematical physics?* Instead of seeking to improve on Euclid, as non-Euclidean geometry does, we must choose an anti-Euclidean physical geometry, which, as Gauss's teacher Kästner argued, tears out all *a priori* choices of definitions, axioms, and postulates at the outset, as Gauss's follower Riemann does. Instead of assuming that physical action is bounded by *a priori*, "ivory tower" notions, as at the blackboard, of space, time, and matter, we must let the physical universe speak for itself: rather than through the voice of some Babylonian or Delphic priesthood.

Here lies the essential issue of fundamental difference between such followers of Cusa, Leonardo, and Kepler as Leibniz, and such notable representatives of the reductionist standpoint in mathematics of the late Eighteenth and Nineteenth Centuries, as Euler, d'Alembert, Lagrange, LaPlace, Cauchy, Clausius, Kelvin, Grassmann, Helmholtz, *et al.* Such is the difference, respecting geometry, between those reductionists and such contrasted French scientific geniuses and Newton opponents as Arago, Lazare Carnot, Monge, Fresnel, Ampère, and Poncelet. This is also the difference between those reductionists and such notable followers of Göttingen University's Abraham Kästner as Carl Gauss, Wilhelm Weber, and Bernhard Riemann.

If we consider the entirety of the now-published writings of Riemann, including what are classed as his posthumously published metaphysical papers, we can not exclude the likelihood, that Riemann was already exploring directions, respecting the physical efficiency

of human cognitive thought, which I have drawn out explicitly, in part from my considering certain implications of his principal writings. However, if I rely only upon my own appreciation of the implications of his principled published work published in his lifetime, it is clear that Riemann's conception of an entirely anti-aprioristic physical geometry (an anti-Euclidean, physical geometry, rather than a merely non-Euclidean one), shows us how to deal conceptually with the three-fold composition of the universe implied by Vernadsky's work.

Thus, we must emphasize, once again, from this standpoint, that the universe as a whole is not to be considered as derived from a primitive, exclusively abiotic beginning. The quality of anti-entropy which is characteristic of both life and cognition, are qualities already embedded in the universe "from the beginning," rather than phenomena derived from a perfectly entropic sort of abiotic origin.

What we witness, as Vernadsky viewed the matter of biogeochemistry in general, is the development of the biosphere through production of naturally produced materials and arrangements, a development which provided the natural conditions required for the appearance of certain classes of species, and so on. We must recall, that the existence of the oceans and atmosphere, typifies the importance of our willful maintenance of those products of life's actions on our planet, and points out the implied penalties of our failure to do so. E.g., the problem of "primitive accumulation" so situated. Similarly, the existence of human life, as an expression of a principle underlying cognition, may be universal, but its expression as conscious life, human life, both in the first appearance of human life and in its perpetuation today, requires the development of pre-conditions in respect to both the preceding abiotic and biotic development of our planet.

The progress of human life, as measurable in various ways, depends also upon conditions created by man, conditions which were not, and are not produced naturally by means other than human activity. These conditions must also be either maintained, or an efficient replacement supplied by the human will. The failure to meet that responsibility, defines the political issue of primitive accumulation.

There is a related, second crucial problem which must be considered, if we are to grasp the implications of the issues of primitive accumulation being addressed here. In addition to the implications of discovering, as if by an isolated individual, that the universe is a multiply-connected geometric domain, of an expanding number of discovered "intentions," each in the form of universal physical principles, there is the matter of the social relations through which such discoveries for practice are transmitted within society. Here, in the role of the

social processes defined by cognition as such, lies the essential difference between my definition of the noösphere and that of Vernadsky's known writings.³⁰

1.1 Primitive Accumulation and Classical Education

The transmission of an individual's discovery of a universal physical principle, through the replication of that act of original discovery within the sovereign cognitive processes of other persons, is the only proper, rigorous basis for defining what should be called education. The proper form of transmission of discoveries of a crucial significance for today's society, from even the remote past, is what is known as *a Classical humanist mode of general education of the young*, as the famous reform of Friedrich Schiller's follower Wilhelm von Humboldt typifies this.

To understand the implications of the concept of primitive accumulation for shaping a nation's policy, we must look at the entire economy, both the national and world economies, from a standpoint which features such a Classical humanist notion of generalized public education.

For this reason, during my published writings of the recent seven years,³¹ I have frequently employed an improved form of pedagogical defense of those discoveries of mine dating from the 1948–1952 interval, by aid of a particular kind of reference to Raphael Sanzio's famous portrait of *The School of Athens*. I employ that pedagogy, again, here.

This reference involves a conception, sometimes called, in Classical usages, "the simultaneity of eternity," which is of crucial importance in defining the functional relationship between Classical-humanist models of educational policies and scientific-economic processes of societies. The direct relationship of that aspect of education, to the subject of primitive accumulation, I shall address at a relevant later point in this report. I now introduce that definition of education, at this point in my argument, for its immediate relevance to the issues posed by Vernadsky's definition of the noösphere. I emphasize that this is a crucial aspect of the concept of a noösphere, which is necessarily overlooked in focussing merely upon the direct relationship to the noösphere, of the individual as such.

To emphasize the point made above: In the methods of physical science, and in opposition to the tenaciously held, fallacious presumptions of at-the-blackboard mathematical formalists, such as Russell, Wiener, and von Neumann, the definition of a universal physical principle arises, entirely outside previously existing, formal mathematical systems. It arises, in its typical first reflection, as our confrontation with a mathematically insoluble ontological

³⁰ I do not assume that Vernadsky was not an advocate of a Classical human education. His writings indicate that he was. The point is, that he did not draw out the conclusions which I have made.

³¹ Lyndon H. LaRouche, Jr., "How Bertrand Russell Became an Evil Man," *Fidelio*, Autumn 1994.

paradox, which the experimental evidence imposes upon the effort to represent that evidence in terms consistent with a preexisting choice of mathematical, or equivalent system.³² The already referenced discovery of universal gravitation, by Kepler, and Fermat's discovery of least time, are leading classroom examples of this distinction for classroom and related use.

The only solution for a valid such paradox in mathematical physics commonly so-called, is the generation of a *physical* hypothesis of the type, which, once proven experimentally, constitutes a newly discovered universal physical principle. If so proven, that principle then becomes the functional equivalent of a new physical-geometrical axiom of mathematics, that according to Riemann's definition of physical geometry. As this point can be demonstrated even within the bounds of a well-composed secondary education, this principle forces a corresponding transformation of the existing mathematical physics, and, sometimes, radical transformations in our ideas about mathematics as such.

On this account, Kepler's uniquely original discovery of a principle of universal gravitation, in opposition to the incompetent methods of Ptolemy, Copernicus, Brahe, and the empiricist Galileo, is paradigmatic for all modern physical science. The statistical methods of Vernadsky, used to define life as a distinct principle, and to define *noësis* similarly, are examples of this same principle, the principle otherwise called *docta ignorantia*, coincidence of opposites, *Analysis Situs*, or simply Socratic method.

This method has three principal aspects, all of which come into focus when the acts of discovery and experimental proof of a valid physical hypothesis are juxtaposed within the framework of what is best identified as a Classical humanist mode of general education. The point to be made, is perhaps made most clearly when one situates the lesson to be adduced from Raphael's *The School of Athens* in such an educational setting.

Any discovery of an experimentally validated universal physical principle, has three categorical features. First, as I have said, there is the ontological paradox. Second, there is the discovery, by cognitive generation within the individual mind, of the hypothesized universal principle which would bring our understanding of the universe into correspondence with the experimental evidence. Third, there is the crucial quality of experiment which validates that hypothesis as of a universal character.

The special difficulty each such three-fold act of discovery poses, is that no universal physical principle, as such, exists, or could exist, in the form of an object of sense-perception. Such principles are of the ontological quality which Plato references by his allegory of the shadows

³² This issue of the intrinsic incompleteness of any formal mathematical system, is the core of the fraudulent treatment of Leibniz's monadology, and of the Leibniz calculus generally, by Euler, Lagrange, Laplace, Cauchy, *et al.* The same issue arises in a related way in the 1880s work of Georg Cantor, and in Kurt Gödel's celebrated refutation of the wild and arbitrary claims of Russell and von Neumann.

on the irregular surface of the wall of a dimly fire-lit cave. The task, as in microphysics in particular, is to discover, and to know with certainty, the existence of the unseen object which casts the shadow. Vernadsky's definitions of both life and cognition, respectively, are each an illustration of Plato's argument. So, the function of education is to be situated within the noösphere.

An Hylozoic Universe

Situate that issue of scientific method within a functional definition of the noösphere. View Raphael's *The School of Athens* from that vantage-point.

In Vernadsky's argument on these points, the relevant shadow as such, assumes the form of statistical evidence of a crucial quality of significance. In this, he describes himself as following the path trodden by Louis Pasteur *et al.*, on the matter of defining the efficient existence of a universal principle of life: Certain patterns of perceptible, distinct reactions, occur in the presence of living processes, which do not occur otherwise, at least not in a statistically significant degree. The branch of science called biogeochemistry, addresses these phenomena and their implications. I have defined a principle of universal cognition differently, but to similar effect, defining it as distinct from the characteristics of species which are, functionally, systemically inferior to human beings.

I emphasize my agreement with Vernadsky on the point, that seemingly relatively weak forces of life, reshape, over an accumulation of time, what appear to be the relatively powerful forces of the abiotic Earth. Seemingly ephemeral, cognitive forces, reshape, over an accumulation of time, the combined forces of the abiotic and biotic domains.³³ The future of the universe, is thus shaped, so, by the interventions of ostensibly "weak forces."

The view, that the universe, when considered in all of its combined aspects, is ontologically a living, in addition to being an abiotic one, was known to Classical Greece as the notion of a *hylozoic* universe. This idea, already a well developed concept among some of the Classical Greeks of Plato's lifetime, regained notable attention of physical science with the impact of relevant discoveries of Pasteur and his followers. Continued attention to the work of Pasteur *et al.*, by that current, modern experimental physical science which was developed in Europe

³³ Hence, I have insisted that it is an error, which appears among persons otherwise sympathetic to the work of Vernadsky, to degrade any manifest physical efficiency of the cognitive function, to the existence of a form of thermodynamic "energy." Thus, Hermann Minkowski, in his celebrated 1907 lecture, delivered a powerful, and needed argument for the superseding of Euclidean geometry by relativistic physics, but then erred by proposing to substitute a non-Euclidean geometry, that of Lobachevsky, for the needed anti-Euclidean physical geometry of Riemann. Once we have escaped the delusory schema of perfectly abiotic thermodynamics, of Kelvin *et al.*, we make a fatal error if we attempt then to degrade the principle of action specific to life or cognition, by proposing to return to the pathology of assuming an original basis for the universe in the reductionist thermodynamics of Clausius, von Neumann, Wiener, *et al.*

beginning the Fifteenth Century, has brought the ancient concept of an hylozoic universality to the fore, at least in some important scientific circles, in a fresh, more powerful, and more conclusive way.

The special significance of the relevant work of Vernadsky, and of such followers as Gurwitsch, is that modern biophysical scientific practice impels and aids us in focussing experimentally upon the nature of the interactions between living and non-living processes.³⁴ For example, experimental study of biophotonic interactions among living tissues not otherwise in direct interaction, expresses a most important general question, one bearing directly on issues of primitive accumulation in the domain of physical economy.³⁵

As Vernadsky emphasizes, the action of living processes upon the Earth, has created a biosphere in which the products of the action by living processes, have produced such necessary preconditions for higher living processes as the creation of the oceans, atmosphere, and soils. In that context, the interaction of non-living products of living processes, in providing the preconditions necessary for higher evolution of the biosphere as a whole, bring into focus a crucial question of physical science as a whole. This view of an hylozoic universe, over which the specifically human principle of cognition reigns, is the foundation for any competent study of the problems of primitive accumulation. This touches a crucial feature of Academician Lvov's warning.

Regard these notions of life and cognition, as universal physical principles, as from the standpoint of Kepler's discovery of universal gravitation. How does life express what Kepler identified, as in his revolutionary *The New Astronomy*, as that same quality of *intention*, as that feature of the Solar system which defined the regularity of orbits of constantly non-uniform curvature?

In Kepler's work, that use of *intention* corresponds explicitly to what modern science since Cusa, Leonardo da Vinci, and Kepler recognizes as a *universal physical principle*, just as Kepler was the first to discover and define a universal physical principle of harmonically ordered gravitation. In any rigorous definition of the term "science," we must limit ourselves

³⁴ A translation of Gurwitsch's description of his work (Alexander and Lydia Gurwitsch, "Twenty Years of Mitogenetic Radiation: Emergence, Development, and Perspectives") appeared in the Fall 1999 issue of *21st Century Science & Technology*. In addition, see the two-part article by Gurwitsch's student, Michael Lipkind, "Alexander Gurwitsch and the Concept of the Biological Field," which appeared in the Summer 1998 and Fall 1998 issues of *21st Century Science & Technology*; and Jonathan Tennenbaum, "A Dialogue on the Importance of Keeping People in a Healthy, Unbalanced State" and "Beyond Molecular Biology: The Biophoton Revolution," *21st Century Science & Technology*, Winter 1998–99.

³⁵ Jonathan Tennenbaum summarizes some recent work in the Gurwitsch tradition, on biophotonic interactions in living tissue, in "Russian Scientists Replicate 'Impossible' Mitogenetic Radiation," *21st Century Science & Technology*, Winter 2000–01. See also, "Russian Discovery Challenges Existence of 'Absolute Time,'" on the work of Prof. Simon Shnoll, by Jonathan Tennenbaum, in *21st Century Science & Technology*, Summer 2000.

to thinking of *willful* forms of action, which, when discovered and applied, enable mankind to increase its power to exist within, and also over the universe.

The conscious expression of what has been proven to be such a universal physical principle, is our consciousness of it as our own willful, conscious *intention* to produce that quality of effect which is a specific expression of that universal principle. In other words, we do not know such principles as existing apart from the human will, outside of our consciousness of them.

What we know is three-fold. We know our *intention* to bring about the effect with which that discovered principle is associated in our mind; we know the paradox which provoked that discovery, and we also know the result which the relevant experimental evidence points out to our intention. If we keep those distinctions in mind, we will avoid many of the follies all too commonplace in what is often considered today's expert practice. This *willful, even impassioned* character of *intention*, as I have identified such notions of an impassioned, voluntary impulse, as distinct from the notion of deductive proof, is the crucial point to be kept in mind.

If we are not to commit the blunder of repeating the linear, "connect-the-dots" methods used by Copernicus and Brahe, we can not assume that random actions of "natural selection" enabled life to create the previously non-existent preconditions for higher forms of life. It is an echo of the same problem recognized and solved by Kepler: if the universe operated as the mathematical methods of Copernicus, Brahe, and Galileo imply, the Solar system could never have existed. There must be an intrinsically adducible *intention*, embedded in the principle of life, which governs the "orbit" of *hylozoic* development, in the same sense that the principle of *intention* embodied in Kepler's Sun orders the regular orbits of the planets.³⁶

Consider the economy's depletion of its environment from that standpoint. Define the challenge of primitive accumulation from that standpoint. That presents us with three categories of depletion to consider: a.) the abiotic features of the environment essential to human existence; b.) the biosphere as essential to human existence; c.) those products of cognitive development of the society on which the continuation of the upward development of the productive powers of labor depends. It is in the last of those three that the role of education, and the significance of my present reference to *The School of Athens*, lies.

To restate that crucial point: the preconditions for the possibility of sustainable human life on our planet, are thus three. First, the existence of the Sun, and of the creation of the Solar system, with its development, from that Sun. Second, the development of living processes, thus developing the biosphere, on our home planet. Third, the cognitive development of the

³⁶ Such was the nature of Vernadsky's triumph over the failed method of mathematical biophysics of Nicolas Rashevsky.

human species, which is expressed as an accumulation of discoveries of experimentally validatable universal physical principles.

That means that whatever is physically efficient as an effect, whether in abiotic, living, or cognitive processes, expresses some universal *physical* principle, or set of such principles. Over the past five decades, I have always emphasized, that these principles include those universal physical principles properly associated with Classical, as distinct from Romantic, modernist, and post-modernist, artistic composition. The arts of statecraft, such as law and history, are derived from the impact of Classical modes of artistic composition and performance, in fostering the insight of the population.

That store of knowledge represented by surviving discoveries of the universal physical principles of abiotic, biotic, and Classical artistic principles, is represented by an accumulation of the interconnection among those three categories of universal physical principles which, by definition, do not exist as objects of sense-perception. The following set of observations, is therefore crucial for understanding the role of education in determining the ability of a society to continue to exist at even its present level of development of its population.

To understand this matter, the relevant argument must start from the recognition that, as I have just said, *neither valid discoveries of universal physical principles, nor the individual mental processes by which those principles are discovered, are a subject of sense-perception, or of deduction.* The act of discovery occurs only as a sovereign cognitive act of an individual mind, a process which is perfectly opaque to the sense-perceptual powers of an observer.

Thus, contrary to sophist Immanuel Kant's "Dialectic of Pure Practical Reason,"³⁷ the communication of a valid discovery (*noësis*) of a principle, can not occur directly, as perception of the actual discovery. It can occur only by inducing a *truthful* replication of the act of cognitive hypothesizing by one mind, within the cognitive processes (*noësis*) of a second person. That conception, so shared, becomes truthful human knowledge, when it is proven, and thus known to be specifically efficient, by relevant standards of experiment. Such is Plato's method of the Socratic dialogue.

In all competent modes of education, those which approximate, at least, what is termed Classical humanist education, the student relives the experience of the actual mental process by which an Archimedes, for example, discovered a universal physical principle. The commitment to a principle of Socratic truthfulness, respecting the adoption of ideas of principle, thus produces a resulting state of memory which we should recognize as the true form of knowledge.

³⁷ Immanuel Kant, *Critique of Practical Reason* (1788) (Indianapolis and New York: The Liberal Arts Press, Inc., division of Bobbs-Merrill Co., Inc., 1956 edition).

What is thus induced in the student which corresponds to what Raphael portrays as *The School of Athens*? Many personalities, most of whom are not contemporaries of one another, live still, as sovereign personalities, cognitive beings, in the mind of each student who has reexperienced, which is to say *personally* reenacted, relevant *cognitive* acts of discovery of principle by each of these figures. We must call such remembered experiences living memories of living beings, and sovereign ones at that. We must do so, because, as we should easily recall, the action which generated the idea of that principle in the mind of that discoverer, lives, and acts, as an efficient cause of action within the living process of our own memory.³⁸

The crucial fact about this, is that such a memory is a memory of the relevant act of cognition by that discoverer. Therefore, the image of that person in one's memory, is not a motion-picture image; it is an image of a specifically human act, an act which can be performed only by a living cognitive being. Therefore, the memory of that act is both a living and a human object within the memory of the rememberer. In effect, in that degree, the mind of he who remembers has given rebirth to the living personality of the discoverer. That discoverer lives again, in that manner and degree, in the mind of the rememberer.

The same thing occurs in all valid performance of great Classical works of artistic composition. The great actor of the Classical tragic stage, brings the character portrayed on stage to life in that way; that actor summons the cognitive personality of the character into true life, which lives, breathes, and thinks, upon that stage.

What the graduate of such an education applies to the challenges of his or her profession, is the resources represented, in that manner and degree, by all those personalities who are still living, in that way, within the graduate's cognitive memories of their moments of true discovery. It is the sharing of that historical-cognitive experience, reaching back into innumerable earlier generations, which the members of contemporary society bring to bear on making the decisions which shape contemporary practice.

The maintenance and improvement of that store of cognitive knowledge, from past and present combined, is as much the stored-up physical-economic capital of a national economy, as the society's investment in tangible capital goods, or infrastructural improvements, or the natural resources which are drawn upon. That stock of cognitive intellectual capital is, indeed, the most important kind of physical-economic capital of any society.

³⁸ Cf. Plato, *Phaedo*, Loeb Classical Library (Cambridge, Mass.: Harvard University Press, 1963). Also, Moses Mendelssohn, *Phaedon: The Death of Socrates*, J. Cooper, trans. (New York: Arno Press, 1973, reprint of 1789 translation).

Thus, the net depletion of the human resources provided by the development of the Solar system, such depleting of resources produced by life's action on the abiotic Earth, and the depleting of society's store of accumulated discoveries of universal physical principles, each and all together represent three forms of primitive accumulation which tend to threaten our society's future. We must either replace the relevant portion we have consumed, or must provide a functionally efficient alternative as replacement. Thus, the elimination of Classical humanist methods of education, is not only an economic disaster for a nation, but one of the most deadly forms of destruction of the possibility for maintaining the present level of human existence, one of the most malicious of all forms of primitive accumulation.

The individual does not act upon the economic process called society, from the standpoint of an individual acting according to a particular, isolated individual discovery. The ability to make such a discovery, depends upon the student's building up something akin to Raphael's *The School of Athens*, in his or her own sovereign cognitive processes. It is the living dialogue of such personalities, within the body of memory which is that student's sovereign cognitive processes, on which the student relies, to generate the act of *insight* leading toward his or her own, original tentative hypotheses. It is through sharing the fact of the common experience of such a memory with other sovereign intellects, even many long deceased, that such insights are evoked in the minds of the other. It is through collaboration so ordered, that cooperative action in adoption and use of discoveries by society, may occur.

The individual discovery of a universal physical principle is, thus, never directly applied to nature. Rather, it is first applied to the multiply-connected manifold of principles already existing in the discoverer's mind. What is then applied to society's practice, is the full force of the implicitly Riemannian manifold of all of the universal physical principles existing in the mind of those sharing those discoveries as a cognitive form of knowledge.

It is, therefore, not the isolated discovery, by the isolated individual, which generates the maintenance and increase of the potential relative population-density of society. It is, rather, the individual's fruitful intervention into the accumulated knowledge of society to date, as represented, not only by himself, but also the other members of society with whom he or she cooperates, and those who have gone before, thus to bring effective change about.

This contribution by the individual, depends, functionally, upon the degree of moral and related cognitive development accumulated in the relevant other members of society. If they are ignorant on this account, they will tend to respond foolishly even to the best and noblest of useful innovations, as we see this demonstrated in the average scientific and other cultural decadence of the current U.S. population, for example, relative to that of professionals two or three generations earlier.

This is not merely a matter of accumulation of formal knowledge of physical principles. The array of principles contained in such a developed memory of past discoveries of principle, is far greater than the sum of its parts. The history, as various known or implicitly reflected, by means of which these discoveries of principle have come into existence as knowledge for that individual mind, is expressed, in the unity of those ideas, as a quality best termed "judgment." This quality of judgment points toward a conception sometimes called "the simultaneity of eternity."

The Space-Time in Which We Think

This view of education leads us into a pair of directions for further reflection and exploration.

The first such consideration, impels us to ask ourselves: what is the implication for the application of physical science, of shifting the emphasis, away from those actions which today's popular opinion imagines to occur within what we might assume to be an axiomatically fixed, sensory domain of practice, into an alternate domain, in which the most significant action, is the class of cognitive acts of generating and reenacting experimentally validated discoveries of universal physical principle? These latter represent a species of ideas not apparent through sense-perception, but which are not only demonstrated to exist, but which are fully efficient existences in our functional relationship to the universe.

The second consideration is, what does that shift in standpoint of physical-science practice signify, for the development of both the moral and physical potential of the individual person and society? What does such development of the individual signify for the survival and progress of cultures and civilizations?

Look at these matters from not only physical science and economy as those might be ordinarily defined, but from the standpoint of Classical artistic productions.

What is the relationship of the student in today's classroom, Johnny, who has just reenacted successfully the cognitive act of a certain discovery of principle by Archimedes, to the Archimedes who was murdered by the Romans approximately 2,312 years ago? Ask: looking at this from inside Johnny's memory of that act of discovery of Archimedes, what is the lapse of time expressed by that action which connects Archimedes' act of thought and the reenacted copy of that thought by Johnny? The paradox is a truly delicious one! More notably, study of this paradox leads us toward comprehension of the most challenging among the implications of primitive accumulation.

To grasp the significance of what I have just written at this point, recognize that one's experienced knowledge of the act of discovery accomplished by Archimedes, increases the power of the person enjoying that knowledge, qualitatively, over the one which does not. Thus, Johnny has not merely copied an image; Archimedes has, in effect, transmitted a

specific quality of increased power to Johnny's ability to think and act. Johnny's society is improved in its power over nature, in that degree.

Therefore, the connection between Archimedes and Johnny's society, is not a simple connection; it is Archimedes' mind acting efficiently upon Johnny's society, changing Johnny's society, through Johnny's mind, in that efficient degree, in that fashion. Johnny, in turn, by realizing a current benefit of Archimedes' principle, has changed the outcome of Archimedes' life for the better.

In such ways, through relationships defined primarily in terms of cognition, we are able to change the outcome of the past, as we may the future which will emerge long after we are deceased.

Situate an original discovery, such as one of Archimedes, as a personalized existence within the memory of Johnny, within Johnny's simulation of something like Raphael's *The School of Athens*. Within that simulation, the development of knowledge of universal principles, the order of the succession of discoveries is well defined, but, in the act directly connecting between the two, Archimedes and Johnny, within Johnny's memory, there is no notion of an intervening period of absolute clock-time. In that momentary relationship between Johnny's and Archimedes' thought, twenty-three centuries of lapsed clock time, are dissolved into an interval whose duration is as but a moment.

Except for the matter of ordering the sequence among such ideas, each pair of persons sharing knowledge of the discovery of such a principle, or its reenactment, lives, as if born again, in that moment, in a moment of a shared simultaneity of eternity. In the domain of cognition, time is, in first approximation, reduced to a sense of relative order of cognitive events as such, rather than the lapse of clock-time between such successive events; here, we see Fermat's notion of "quickest time" driven to its hypothetical limit! The argument is a more or less obvious one, but its implications can be stunning on first consideration.

To calm the agitated state of mind these notions might tend to provoke in the unprepared person, recall the implications of Plato's use of his allegory of the dimly lit cave. What our powers of sense-perception detect, is not the real universe outside our skins, but, rather, the shadows of efficiently existing, but unseen objects, which Leibniz names "monads," such as a selection from among those objects of nuclear microphysics which modern experimental physics, since Wilhelm Weber's discovery, has defined rather well.³⁹ This distinction between

³⁹ Leibniz's concept of the monad is a direct outgrowth of his development of the original calculus. In experimental method, as refined by Leibniz's discoveries, we measure two distinct but connected characteristics of a well-defined object of knowledge. First, we must have crucial experimental proof of its existence; secondly, that existence expresses a variable magnitude according to the functional circumstances in which it is situated. Hence, the intrinsic non-linearity of the interval expressed as the Leibniz differential, as contrary to Euler's linear infinitesimal. Weber's experimental proof of Ampère's principle, is an example of the notion of a monad.

perception and experimental reality, does not make the experienced universe less real, but merely reminds us that our perceptual processes, which are organs of a living process, report to us what they experience, but not the reality which produced that experience. That distinction signifies, that we must resort to the methods of physical science, as biogeochemist Vernadsky did for the biosphere, to discover the reality of the effects which our senses report.

Thus, we have two contending opinions respecting the nature of the physical universe.

First, there is the erroneous, but commonplace view, that of a physics based upon an aprioristic Euclidean or similar geometry, in which sense-experience is interpreted according to the arbitrary assumption, that the real universe outside our skins is more or less Euclidean, or, at the best, non-Euclidean. In the case of such a misguided person, the believer is deluded into imagining that the senses are a transparent window through which to view the naked form of actual developments in the world around the observer. The non-Euclidean, unlike the Euclidean, accepts the curvature of physical space-time in the large, but does not free himself, otherwise, from *a priori* kinds of axiomatic assumptions respecting space, time, and matter.⁴⁰

Then, there is the view, as implicitly developed by Plato's dialogues, that the real action in the universe, is the cognitive action which permits us to extract truthfulness from a paradoxical, and therefore false, perception-bound notion of the universe of experience. We acknowledge, that the thing which bumps against our space-craft's-like sensory periphery, is a real bump, but the cause of the bump has to be determined, scientifically, by those methods of modern experimental physical science introduced by Nicholas of Cusa. The contrast of these two mutually opposing views, leads us to correspondingly different conceptions of the nature of space, time, and matter.

In the popular, pathological view, Archimedes has merely transmitted "information" to Johnny, as if in sealed bottle cast upon the waters twenty-three centuries past. In the second, Archimedes has acted to change Johnny, and Johnny's society; he has transmitted to Johnny not mere "information," but an increased power to act. Johnny's reenactment of that discovery, has also changed the historical outcome of Archimedes' existence. Hence, for such cases, the term "simultaneity of eternity" is employed.

The discovery of the universal principles, which underlie what is proven to be, experimentally, these efficiently real objects, defines the personalized discoveries which inhabit the equivalent of Raphael's *The School of Athens*. The result is of the form of a

In that case, Weber's experiments not only defined the existence of Ampère's angular force, but also led directly to the first meaningful measurement of the effective existence of the electron, even before the existence of the electron was otherwise demonstrated.

⁴⁰ Such was the error, respecting geometry, in Hermann Minkowski's famous lecture.

Riemannian multiply-connected manifold. It is that manifold, as a current state of the sovereign cognitive powers of an individual mind, which governs the act of discovery by an individual.

So, as if from the standpoint of the classroom as such, the notions of space, time, and matter appear to be purely relative. The central feature of that classroom's standpoint, is the relative position of a cognitive form of action, such as a discovery of a universal principle, in respect to the sequence in which it may be generated in a merely academic setting. This is a useful first approximation, pedagogically, but it is not a true representation of the relevant evidence.

The truth of the matter lies in the universe's response to actions governed by cognitive progress in applied human knowledge. It is in the universe's response to our willful interventions, as through the methods of experimental science, that we are able to assign a meaningful, relativistic sense of lapsed time to the process being considered. Thus, the most important real effects are expressed not in linear absolute time, but, rather, in cycles, which are not necessarily simple ones, which express the relative lapse of time which, in that state of society's practice, has become characteristic of the causal connection between certain actions and their effects. The change in such characteristics, as Riemann supplies his preliminary definition of characteristic of a multiply-connected manifold, is properly a subject of the generalized notion of Riemannian manifolds.

Thus, the upward shift to emergence as a truly human being, occurs as cognitive development enables the individual to shed the prison-like pupal husk of blind faith in sense-certainty, to locate reality in those ideas which are the power to change the lawful, cause-effect ordering of the universe in which we live. Sense-perception is thus downgraded to its truthful status as phenomena, as mere shadows of a reality which exists in the form of that manifold of principles by which the universe is actually controlled.

My definition of changes in *potential relative population-density of societies as entreties*, supplies the needed corrective. As I shall emphasize the importance of that distinction, in the subsequent chapter of this report, I define the term *anti-entropy*, with my eye on Kepler, to correspond to an "orbital pathway" of increase of potential relative population-density. This definition of anti-entropy corresponds, then, to a functionally ordered succession of changes in relative values of the society, as an entire process: a "pathway" of *change* in society's potential relative population-density. It is not the change as such, which we must measure; we must measure the rate of change which is characteristic of a *continuing* process; as Plato defined change, as Kepler defined the lawful organization of the Solar system, as Riemann's discovery defines a characteristic change from one manifold to its successor.

Our task is not merely to measure that process, but to cause it to exist, to set the desired rate of change into motion through our adopted *intention*.

Thus, by defining *science* to mean only the practice of cognitive progress in discovery and application of universal physical principles to effect such *anti-entropic* progress of society, we have a way of locating the efficient reality outside our skins, which corresponds to valid ideas generated from inside our skins.

The most immediately crucial problem of method posed by such considerations, is the issue of *efficient intention*. This, as I shall emphasize in the next chapter, identifies the causal factor from which the notion of a functional rate of continuing change can be adduced, rather than the erroneous *post hoc, ergo propter hoc* method of connecting the dots, the erroneous method common to the work of Claudius Ptolemy, Copernicus, Brahe, and Galileo.

The class of actions, by means of which willful actions cause anti-entropic changes within the determination of a society's potential relative population-density, are not the product of dense percussive interactions among individual human wills. Only ultimately entropic effects for society, can be prompted in the kinds of percussive modes prescribed by the English and British empiricists, for example. Anti-entropic effects are achieved solely through a willful (i.e., voluntary), cognitive choice of positive intention by the actor.

A Musical Example

For discussion of those distinctions, use as a standard of comparison, the notion of the willful choice of the type of course of action which governs the change in behavior associated with the adoption of a validated discovery of a universal physical principle. Choose an example of this from the standard of performance required for a Classical musical composition of the type generated from the root of the work of J.S. Bach by such Classical polyphonists as Mozart, Beethoven, Schubert, and Brahms.

In this case, the performer does not merely follow the notes of the score. Rather, as the nature of such Classical polyphony requires, the performer must proceed from an insight into the composer's intention of what is to be accomplished by the time the conclusion of the composition is reached. In all such cases, as contrasted with the pathetic views and practices of Rameau or the prescriptions of Fux, the composition has been crafted under the governance of a quality of principle which corresponds exactly to a universal physical principle. The object is to create an idea in the mind of both performer and hearer, an idea akin in quality to an idea of scientific principle.

Proceeding in that way, the morally responsible professional performer does not perform the work for a public (except as in the form of a pedagogical experiment, a pedagogical dialogue), until he or she has grasped the entire work as if it were a single idea compressed into a momentary thought of memory. Yet, everything in the elaborated work performed, shall be necessary to evoke that effect in the mind of the audience. It is that consideration,

which prompts morally inspired professionals to rework the performance of a masterwork over and over again, over the course of their lifetimes, always determined to convey the idea more effectively than before. Thus, by such life-long persistence, they perfect themselves, and those who benefit from their precedents.

In other words, the performer and composer are combining their efforts, in this case, to produce the replication of the composer's discovered, intended idea, in the mind of the hearer. In other words, in a well-performed such Classical musical composition, the communication effected by means of the performance, is an idea in the same sense the idea of a principle earlier discovered by Archimedes may be re-created within the mind of a student today.

The performance of a Classical musical work composed according to the J.S. Bach tradition of well-tempered polyphony, expresses exactly the same principle associated in the communication of an idea of principle from the mind of Archimedes, to Johnny. The essence of such a composition, does not lie in the sensory domain as such. Rather, as in any experimental demonstration of a conception of universal principle, the sensory aspects of the process mediate the transmission of the idea which can not be contained explicitly in the performance as such.

As the poet John Keats reminds us, it is the unheard sound of the idea, which motivates the composition and performance, which is the true subject of such a Classical composition, not the sensual effects as such. The performance is the experiment which must demonstrate, and thus communicate the principle, the idea which is the intent of the composition. The performance appears to be in the sensory domain, and what is done in that domain must be well done; but the content of the performance is located in the higher, cognitive domain.

Admittedly, for the musician first grasping that conception, the initial recognition of the fact that such is the true nature of the idea to be conveyed by the performed music, evokes an eerie sensation. It is the same quality of eeriness encountered when a student first recognizes any true idea of universal principle.

Just as any experimental proof of a universal principle must meet exacting standards of design and performance, so the great performing artist is encumbered. However, the idea which is imparted, is of the quality which inhabits the domain of *The School of Athens*. As a corollary matter, the power and authority of the Bach tradition of Mozart, Haydn, Beethoven, Schubert, and Brahms, is that no other discipline than well-tempered Classical, thorough-composed polyphony, is suited to express such communication with such beauty and precision.

The qualified performer seeks to induce that latter effect in the individual member of the audience, at least of some among them. To that purpose, the performer must muster a certain passion. That passion matches the intention, and is aimed zealously to bring the intended result into effect. That passion, that intention, grips the will of the accomplished performer, just as the discovery of a needed hypothesis arouses the cognitive passion and intention of the discoverer of a newly discovered universal physical principle, or inspires the young student to reenact an original discovery by Archimedes.

Such Socratic passion for truthfulness, is the active quality of moral motivation in all aspects of individual social life. Such is the principle of truthfulness which distinguishes Classical artistic composition from the Romantics, the modernists, and the popular. The requirement is, that art must always be truthful, must never be arbitrary. It must conform to what is usefully recognized as *the good*.

In general, the notion of a *good will*, must be recognized as an impassioned, efficient intention to promote the anti-entropy of human existence: mankind's increased power for good, within and over the universe.

This must be the law for society; but, there is an intervening problem. Who shall inspire a society to muster itself for such purposeful courses of action? What is the distinctive quality of persons who have developed such qualifications for leadership of their fellow human beings?

Within my lifetime's experience, I have observed chiefly two types of cases in which such qualities of leadership are expressed, at least in significant approximation. In one case, an individual rises above what appears otherwise to be his or her standard behavior, to put himself or herself even at great risk for the nation, or for what might be carelessly described as some other sort of "conspicuously selfless" good deed. In the other, more significant case, we have the dependency of societies in crisis, upon the appearance of and selection of exceptional persons with true qualities of leadership. Emphasis upon the latter case is sufficient for our purposes in this report.

The moral problem, which is to be observed, with a certain sadness, among even most of the society today, is that they degrade morality to a certain, relatively "small-minded" notion of self-interest, or even into a sophist's lists of "single-issue" do's and don't's.

The person whose sense of identity is located in a conscience assembled as the members of Raphael's *The School of Athens* are, locates his or her sense of personal identity in a loving sense of obligation toward those minds which inhabit the living individual's memory of discoveries of principle contributed from the past; and, a complementary sense of obligation to the future of mankind. That individual's sense of personal identity, is essentially both a

cognitive and an impassioned one, rather than merely a response to the sensed experience of oneself situated within perceived present times.

Relatively small-minded persons locate their self-interest in the smallness of a few years, a few decades at most, of family, community, and national life; and with a customarily diminishing sense of responsibility for consequences of their behavior, as matters become relatively more remote from immediate ordinary notions of self-interest. The problem which confronts the qualified leaders of society, is, that most of the persons in society have not really grown up, and most, still today, never will. They have not reached that level of truly adult maturity which is typified by the mind which locates its existence within the simultaneity of eternity. Worse, most of them would not wish to attempt to attain that higher moral status: "I have more urgent, immediate personal interests, and desires, to take care of."

Such persons may be inspired, under exceptional circumstances, to rise, as if above themselves, to higher motives; but, this occurs only under exceptional conditions of stress, and, usually, only when such stress is combined with the impact of exceptional leadership upon them.

The most notable moral problem found among nations whose population is not really bad, is that in history so far, only a very, very tiny ration of the total population ever attains true intellectual and moral maturity. In times of crisis, either the lack of such rare leading persons, or the rejection of their properly leading role, will usually prove more or less fatal for the future condition of that society as a whole. In all great crises, as the best Classical tragedy points this out, the society will fail, as Hamlet's society did, unless the right combination of a sense of crisis and of leadership for a time of crisis uplifts them, for at least a time.⁴¹

Therefore, on this and related accounts, the most urgent of the long-term interests of any society, is the development of the relatively greatest possible numbers of truly adult members of society, those who approach that quality of a sense of an historical "simultaneity of eternity" which a nation in systemic crisis should require of its leadership. On this account, only a nation whose policies of education at least approximate the standard of universal

⁴¹ To appreciate my point, one must reject that perverted Romantic's view of Shakespeare's work in general, and of the definition of "tragedy," which is associated with such figures of academic repute as Coleridge and Bradley. While Hamlet's corpse is being hauled off stage, silly Fortinbras promises to lead the kingdom into more of the folly which carried Hamlet to his bloody demise. While Fortinbras rants on, Horatio, speaking to the audience, warns that we must study what had happened to Hamlet now, while the experience is fresh in mind, lest such follies be reenacted. Classical tragedy presents us the hero as flawed by the fact that his behavior is, not some personal character flaw, but is all too consistent with the generally accepted moral standard of the foolish society which he or she represents. The folly of the American people is not that their leaders have betrayed them; it is that those people have chosen, by preference, the leaders which are seen to reflect the nation's currently prevailing popular opinion.

Classical human education, is well equipped, either to avoid, or to overcome devastating forms of self-imposed and related suffering.

The failure to develop and maintain the quality of the population, according to that standard, by Classical-humanist educational policies and other means, is therefore to be counted as among the most deadly expressions of primitive accumulation: primitive accumulation against that upward cultural development, on which continued success of civilized forms of existence depends.

Those exceptional persons, who meet the standard of maturity implicit in the lesson of *The School of Athens*, are what Plato sometimes identifies by the image of "the philosopher-king." A similar case is that of the exceptional military leader, whose insight into a principled flanking approach, an approach contrary to the prevailing opinion of his subordinates, prompts the forces he leads to take the course of action leading to victory.

The principle of leadership illustrated by such cases, as by Plato's allegorical argument, is that those who locate their self-interested personal identity in the future consequences of their present choices of action, are the only figures likely to provide their society the needed pointing of the way out of an otherwise terminal sort of systemic crisis, such as that threatening all humanity immediately today.

Such leaders are able to succeed in this role, only on the condition that their intervention lifts those who follow them into sharing their own view of an orientation to the future state of humanity to be achieved. The object of leadership, in such endeavors, is to lift those who follow them, at least temporarily, from the latter's accustomed tendency toward moral mediocrity, away from that habituated smallness of mind and morals which locates "self-interest" in the "here and now."

The method by which this function of leadership is accomplished, is the method we might best learn from the model of *The School of Athens* as I have used it as illustration here. To perform that role of leadership, the leader can not adopt the role of an ordinary actor on stage or screen; he must become, must be, *cognitively*, the character he plays in that moment of crisis. In such a situation, no script writer can provide him the lines he must speak, except himself. He must therefore be the part he plays; he must be the rare, morally matured and impassioned intellect his role demands of him.

2. Change as Economic Value

The paradox which led Kepler to his founding of a modern basis for mathematical astrophysics, in his *The New Astronomy*, was his recognition that it was impossible, using the prevailing mathematical methods of the relatively decadent Sixteenth Century, to

forecast both the position and velocity of a planet, within its known orbit as a whole, for a particular time. This problem, in particular, prompted Kepler to specify the need for the discovery of a calculus to future mathematicians. Leibniz's original and unique discovery of the calculus, was a solution for Kepler's proposition. As I have already emphasized, in the preceding chapter, it was a calculus in which, contrary to the hoaxes perpetrated by the fanatical reductionists Euler, Lagrange, Laplace, Cauchy, *et al.*, the interval between two moments of a continuing process, can never be reduced to a mere linear approximation.

The folly of Euler, Lagrange, Cauchy, *et al.*, in their fraudulent misdefinition of the calculus, pops up again as the chief source of the incompetence of most national income accounting practiced throughout the world today. A corrected notion of the differential, one consistent with Leibniz's monadology, is required to define the form of calculations required to overcome the usual blunders in defining measurements of relative economic value.

*In all of the important paradoxes of physical science, including physical economy, a similar difficulty arises. As for Kepler's recognition of the paradox which led him to discover the principle of gravitation, in the case of every leading discovery of principle in science, the paradoxical evidence at hand has suggested that the future is determining the present.*⁴² In all cases of otherwise regular trajectories which exhibit characteristically non-uniform rates of curvature, such as the Solar orbits examined by Kepler, this conceptual problem is encountered: the completed orbital cycle of Earth is regular (with certain long-term qualifications), yet the attempt to determine both the position and velocity of the planet in that Earth, from the immediately preceding observations in the short term, breaks down; it appears, thus, that the future (the apparent regularity of the orbit) is determining the non-uniform curvature of the present interval immediately ahead. The same quality of irony arises in Fermat's recognition of the principle of quickest time.

Thus, since the work of Kepler, Fermat, Huygens, and Leibniz, for example, one of the leading topics of scientific work, is the ability to adduce notions of mathematical functions, by aid of which we can forecast the pathway of future unfolding conditions from an insightful reevaluation of present knowledge. When attention is shifted, to focus upon the matter of forecasting future human behavior, an entirely new, higher category of problems confronts us: the factor of what we call the individual human will. Since I have demonstrated, recurrently, some unique and historically important successes in the matter of forecasting, I have the relevant credentials for addressing the way in which this challenge is expressed in economic processes.

⁴² For example, the case of the Crab Nebula, from which, it appears, the principal concentration of cosmic-ray showers on Earth originate. This otherwise somewhat well-known phenomenon, presents us with precisely such apparent anomalies of what are potentially the most interesting quality.

Academician Lvov's reference to a margin of cost which is not taken into account in today's customary accounting practice and economic doctrines, presents us with a problem which can not be solved by explanations of existing doctrine. This requires a revolution in thinking about estimating the costs of production.

From my standpoint in physical economy, the solution to that paradox of accounting is elementary in nature, but not so simple in practice. For such problems arising in science, precise estimates often escape us, but, nonetheless, the practical way of approaching such difficulties of estimation, can be made clear to us, more or less readily. Such is the case as I now address it here.

The subject of this chapter, is the estimation of the true costs of consumption, taking into account the factors referenced by Academician Lvov.

The Bill of Consumption

How shall primitive accumulation be measured? I begin by reporting, successively, on two ways in which it should not be measured. Those examples given, we shall then consider the causes for the highly paradoxical effects inhering in the assignment of a money-price to a standard bill of materials and consumption.

The question is: *What is net economic growth?* Better said: *What is net physical growth, measured in terms of physical science, rather than today's accounting practice?* Therefore: *How shall we define the specific problem of measurement posed by Academician Lvov's reference to what I have identified as the problem of primitive accumulation?*

During a 1984 half-hour nationwide telecast, I pointed to a current willful fraud then being perpetrated, on a large scale, by the joint efforts of the U.S. Federal Reserve System and the Federal Government. I identified the hoax in question as "The Quality Adjustment Index."⁴³ That fraud is being practiced, still today, with as much irrational exuberance as in 1984.

Back then, the Federal Reserve System under Alan Greenspan's predecessor, Chairman Paul Volcker, had a problem.

The succession of changes in U.S. policy since the late 1960s, especially under "Southern Strategy" Presidents Nixon and Carter, had gutted both the productive potential and standard of living of the U.S. wage-earners and pensioners, by means of various forms of so-called "fiscal austerity." This looting of the typical households and communities, was also expressed in both depletion of long-term investments in basic economic infrastructure, and

⁴³ Nationwide half-hour Presidential campaign broadcast, "Stopping the Worldwide Economic Collapse," ABC-TV, February 4, 1984.

of entrepreneurial potential; the effects of this included an escalating real inflation in the cost of living of households.

This looting of the nation and its population, had become savage under Carter's rampant deregulation programs. The most savage of the depredations unleashed under Carter, was the impact of a Federal Reserve Policy which Chairman Volcker himself had identified as "controlled disintegration of the economy."⁴⁴ That controlled disintegration of the economy, which had appeared in 1975 as a new name for the same policies adopted under Nixon and Britain's Wilson and Thatcher governments, is the cause for the systemic crisis which has now reached its decades-long progress into its presently terminal phase.

Under the succession of measures introduced by the Nixon and Carter Presidencies, the incurred physical costs of maintaining preexisting levels of physical productivity, had come to exceed the total net physical output of the U.S. economy. At first glance, most professional economists would be instantly alarmed by hearing the utterance of that statement; nonetheless, despite their misguided, if understandably negative reactions to my report, what I have just said is nothing but true. That truth becomes obvious, if one looks carefully at the actuality of the situation, rather than the falsified conclusions usually read into the misinterpretation of the official statistics. This is one of those facts to which Academician Lvov referred in his testimony to the Duma. To settle that very important issue, so posed, it is sufficient to define the range of facts which must be taken into account to set the record straight.

First of all, we must measure the performance of national economies in physical, rather than inherently deceptive, conventional accounting terms. This means that we must measure input and output per capita, per capita of the labor-force, per square kilometer, and in terms of changes in the demographic characteristics of households, and also of the population considered as a whole. We must include the depletion of basic economic infrastructure, and must include the maintenance of so-called "natural resources," or their suitable replacement, as an essential part of that infrastructure.

We must also conduct those measurements against the background of combined advances and reversals in those technologies which define the productive potential of both the nation and its employed labor-force. Take U.S. aerospace technology as an illustration of this point.

⁴⁴ The policy, by that name, had been introduced in a set of policy-papers produced, during 1975–76, under the direction of Zbigniew Brzezinski, Cyrus Vance, Miriam Camps, *et al.*, as part of the design for Brzezinski's hand-picked Trilateral Commission choice for President, Jimmy Carter. Volcker, campaigning for his appointment as Chairman of the Fed, in England, in November 1978, quoted that policy by name. See, Fred Hirsch, in "Project 1980s": *Alternatives to Monetary Disorder* (New York: Council on Foreign Relations, 1977).

During the period from 1945 to date, the U.S. economy's rate of progress in aerospace potential has been twice set back systemically. The first setback came under a President Eisenhower whose economic policies were misdirected by the same Arthur Burns who rescued Professor Milton Friedman from richly deserved obscurity. The Eisenhower administration shut down the leading work of the space program at the very point it was prepared to put a satellite into orbit, several years before Sputnik. The next systemic wrecking-act came during the second half of the 1960s, with the deep budgetary cut-backs in research and development unleashed under President Johnson, during 1966–1967.

In between, there was, first, under Eisenhower, the initially abortive, frantic effort to take the Huntsville U.S. space program out of mothballs, after both the "Sputnik shock" and several U.S. aerospace "flopniks." Eisenhower's "post-Sputnik" reactivation of the space program, was followed by the much bolder, and highly successful Kennedy "Moon landing" crash program. Ironically, the successful landing on the Moon, under President Nixon, occurred at a time that the space program was already being collapsed. Soon, the last landing of man on the Moon occurred, and man has not been back since.

Meanwhile, under the savage cutbacks instituted under the Mont Pelerin Society-inspired follies of Nixon and Carter, by the time Carter left office in January 1981, the U.S.A. had lost many categories of technology which had been essential for making possible the U.S.'s success in putting men on the Moon.

Similarly, under "out-sourcing" programs such as NAFTA, the U.S. labor-force has suffered a deep-going, far-reaching loss of technologies and related production skills. During the past decade, the spread of the folly called "benchmarking," introduced as a way of employing high-speed idiots (computers) to replace and eliminate the use of qualified design engineers, has destroyed much of the U.S. economy's ability to produce effective products of advanced physical technologies.

Otherwise, during the interval between the inauguration of "Southern Strategist" Nixon, and self-humiliated and disgraced President Carter's exit from office, the deep cuts in the nation's ability to maintain basic economic infrastructure, were the most conspicuous single factor in transforming the U.S. from a prosperously growing nation, which produced more than it consumed, into a decadent economy, depending, more and more, on its use of imperial power for looting other nations. By January 1981, as an angry U.S. electorate afflicted with this situation hoisted a wretched Carter administration out of office, U.S. output was no longer capable of meeting *the current full costs* of reproducing the successfully growing economy of the quality it had been prior to Nixon's 1966–1968 election-campaign.⁴⁵

⁴⁵ For those who remember the years 1977–1981, the 1980 defeat of Carter, and of Mondale later, were "ABC: Anybody But Carter!" Indeed, what sunk George H.W. Bush's 1980 Republican nomination-campaign was my own campaign to take the 1980 Democratic nomination from Carter: when the Bush campaign unleashed dirty

The Anglo-American control over the post-August 1971 international monetary and financial systems, enabled London and New York to loot much of the rest of the world, despite some notable 1970s resistance from France, that in concert with Germany's Helmut Schmidt, from France's President Valéry Giscard d'Estaing. In other words, the imperial quality of continued Anglo-American monetary-financial power, enabled that power not only to loot, physically, much of the rest of the world, but to control the U.S. population itself, more and more, through a "bread and circuses," entertainment-centered policy at home. ("Enjoy your neighbor, in any way it pleases you to do so! Forget economics; the name of the game is 'pleasure.' Call it, as Senator Lieberman did recently, 'culture!'") Include under the heading of pleasure-seeking, buying up targeted, corrupted sections of the U.S. population, with the bribes of a "faith-based initiative;" the religious fervor expressed by that program of political bribery, is plainly faith in the appeal of the checkbook.)

Underneath the financial veneer of imperial financial power, since no later than August 15, 1971, the real economy of the U.S. has been rotting on the inside. If we measure the changes of the 1971–1981 interval to include all of the relevant physical changes, the 1970s were a net loss, and there has been no reversal of that downward trend since. Finally, thirty-odd years of folly have finally, inevitably caught up with us.

Thus, as measured against a standard of per-capita income of ordinary people, a significant rate of long-term inflation has continued during the recent two decades.

The challenge to the Federal Reserve System at this time, was its joint responsibility, with the government, in a legally assigned duty of reporting the rate of inflation in the U.S. economy. Had the relevant statisticians been honest accountants, they would have been obliged to show a substantial rate of price-inflation, as measured in net content of the market-basket of goods and services per capita of household income, especially the income of the lower eighty percent of family-income brackets (**Figure 1**). As part of the attempt to disguise that inflation, the Quality Adjustment hoax was concocted.

The fraudulent trick used by those institutions, was simply to classify some very large increases in prices as representing "improvements in quality," when those institutions' reports were, in fact, suppressing large percentiles of the actual price increases of certain key commodities, under this convoluted pretext. As I presented examples of this in my 1984

tricks against me and my campaign, I shot back with international exposure of Bush's association with Carter as part of David Rockefeller's Trilateral Commission. What the majority of the U.S. voters remembered was the terrible things which the Carter Presidency had done to them, and the U.S. economy as well. They liked Ronald Reagan because he was remembered as a voice from by-gone days, before the "funny-funny" things that had happened over the course of the 1970s. What the citizens hated the most was what the sadistically grinning Jimmy Carter's administration had done to the U.S. economy.

broadcast, this Orwellian swindle was used, to persuade the credulous victims, that "less is better, and therefore you must pay more for it."

That fraud which I exposed back in 1984, has been continued in full force, until today.

Had the Fed statisticians adhered honestly to their assigned duties, they would have continued the Department of Commerce's standard national-income accounting system's standards for "Value Added" of earlier decades. That would have meant counting comparable objects in the market-basket of commodities and general infrastructure, to the effect of presuming that equivalent-use-equals-equivalent-value. Although such measurements are not scientifically reliable ones, at least they are not flagrantly dishonest by intention, as the Quality Adjustment hoax has been. The accompanying figure understates, but nonetheless reflects the degree to which the lower eighty percentile of U.S. family households have been swindled on the subject of price-inflation during the 1977–1999 interval (**Figure 1**).

The consequently fraudulent character of U.S. official accounting on price-inflation, incomes, and output, as effected by aid of "marginal utility" swindles such as the Quality Adjustment Index, is obvious. However, once we put that kind of intended fraud of the officials into account, we are still left with a deeper problem. How shall we determine the composition of total per-capita consumption of the nation as a whole, that in a way which draws the line between net expansion and net attrition in a meaningful way? Consider first, the category of explicit costs of the type which reasonably honest enterprises usually take into account in their profit-estimates; but, also, as Academician Lvov has done, certain important implicitly added costs attributable to what I have identified as primitive accumulation.

I turn to two examples of devastating frauds in national-income accounting-practice widespread in the U.S.A. today: national economic and accounting policies on health-care and energy.

The Hill-Burton Case

First, consider the problem of defining a standard for health care. I shall emphasize the relevant trend inside the U.S.A., simply noting that the same pattern of ruinous policies is being pressed at an accelerating rate in western Europe.

In the immediate aftermath of the 1939–1945 war, the U.S. Congress enacted one of its best pieces of legislation of the recent fifty-six years, the so-called Hill-Burton Act, which set the pace for national health-care objectives and practice. This Act remained law, until its was overturned by the Nixon administration's Health Maintenance Organization (HMO) legislation.⁴⁶

⁴⁶ The Hill-Burton Act, "Hospital Survey and Construction Act," became law on Aug. 13, 1946. For excerpts, see *EIR*, May 5, 2000, pp. 11–12. The "Health Maintenance Organization Act" became law in December

The Hill-Burton Act had three crucial features.

First, as to doctrine of constitutional law, Hill-Burton was designed in conformity with the most fundamental principle of law in the U.S. Constitution, the so-called "general welfare clause" of the Preamble of that Constitution.

Second, it reflected the relevant accumulated experience of European civilization, most notably since the mass death-rates from infectious disease and other causes, during Europe's Fourteenth-Century New Dark Age; and, in addition to great waves of epidemic disease, the effects of prolonged wars. The lesson was, that whatever the contribution of local and private initiative might be, the modern sovereign nation-state had an unshirkable responsibility, and irreplaceable capability, for organizing defense against generalized calamities which affect society as a whole.

Third, the accumulated experience of a series of great wars—the U.S. Civil War, the 1914–1917 war in Europe, and the general war of 1939–1945—had placed a great responsibility upon the U.S. government, especially its military arms, for creating the systems of organization of sanitation and health-care which are indispensable for addressing both military and non-military requirements, either in war-time, or under conditions of peace.⁴⁷

The combination of President Franklin Roosevelt's fight, against what he called "The American Tories,"⁴⁸ on behalf of the constitutional principle of the general welfare, and the scale of both the mobilization for, and conduct of the 1939–1945 war, had the effect of conditioning the returning military veterans, and their families, to recognizing the importance of the kinds of benefits which military medicine, including its form of

1973. See Richard Freeman, "The Genocidal Policy Behind the Creation of the HMOs," *EIR*, May 19, 2000.

⁴⁷ Other relevant experiences of European civilization include the chronicles of military medical practice in France, and the history of development of war-time and post-war medical practice in such notable instances as the Crimean War, World War I, and post-World War II health-care policies in Germany.

⁴⁸ Franklin Delano Roosevelt, in his July 2, 1932 speech in Chicago, Illinois, at the Democratic Party's national convention, accepting the party's nomination as its Presidential candidate, stated his view of America's enemies, the traitorous Tories, which he held his entire life: "There are two ways of viewing the government's duty in matters affecting economic and social life. The first sees to it that a favored few are helped and hopes that some of their prosperity will leak through, sift through, to labor, to the farmer, to the small businessman. That theory belongs to Toryism, and I had hoped that most of the Tories left this country in 1776."

Since the 1763 beginning of the open struggle over independence from Britain, among factions of the North American English colonies, my republic has been divided, both morally and politically, chiefly between two leading factions, one called the "American intellectual tradition," and the other designated as "the American Tories." The latter have been typified, from then to the present day by the families engaged in the British East India Company's opium trade, New York bankers in the tradition of Aaron Burr's Bank of Manhattan, and the southern slave-holders' tradition. Roosevelt made it very plain, as President, that every step forward was being fought against what he termed publicly "the American Tories." The "Southern Strategy" legacy of Presidents Nixon, Carter, and Bush, is that same American Tory tradition expressed by such Nashville Agrarians as Henry Kissinger's patron, Professor William Yandell Elliott.

organization of the delivery of its services, had provided during the war years. With the war ended, was there not a way, combining sundry, voluntary arrangements among relevant private and government resources, to build a nation-wide, county-by-county system of health-care institutions, which would serve the civilian population as a whole as the military medical program had served those in war-time service? Hill-Burton proved to be an appropriate answer to that question.

In some parts of the U.S., of which New York City was one notable example, the performance under Hill-Burton was excellent, into the 1970s. In other, more politically backward regions of the U.S., including Alabama, the progress in implementing Lister Hill's legislation, was slower, the achievements less. Those qualifying considerations taken into account, the system, buttressed by the Federal Public Health service and the military services, worked. It worked well, relative to earlier conditions; it worked very well, relative to the systematic destruction of the health-care system under post-Hill-Burton, HMO policy.

Then, under the combined, Mont Pelerin Society-influenced, general economic, social welfare, and health-care policies of the administration of President Richard Nixon and his Pat "benign neglect" Moynihan, the Hill-Burton Act was overturned.

Soon after that, in 1975, with the bankrupting and looting of New York City, under the guiding hand of Lazard Frères' Felix Rohatyn, the installation of the "Big Mac" program began the disastrous disintegration of the system which had been built up under Hill-Burton. It was the same crew of financial oligarchs which looted New York City under "Big Mac," including the Lazard Frères-linked *Washington Post*, which recently closed the only full-service public general hospital in the U.S. national capital, with the immediate effect of unleashing a clearly countable rising death toll among those who are victims of that operation.⁴⁹

The change to HMO policy was flagrantly immoral. The Congress's behavior, in effecting that change, was as unlawful as it was immoral. It was unlawful, because it was a conscious violation of the most fundamental feature of the Constitutional law of the U.S.A., the Preamble of the U.S. Constitution itself. It was a violation of what is often identified as "the general welfare clause." Look at the issue of lawfulness in the following way.

There are two points chiefly to be made here, and on the case of energy policy, too. First, there is the fundamental principle of law, on which the existence of the modern sovereign

⁴⁹ Edward Spannaus, " 'Planned Shrinkage': Washington, D.C. Gets the New York Treatment" and "The 'Bleaching' of Chocolate City," *EIR*, April 27, 2001; Edward Spannaus, "KKK-Katie Graham's Armies of the Night," and Dennis Speed, "The Case of James Gibson," *EIR*, June 22, 2001; Richard Freeman, "How LaRouche Fought New York's Fascist Financial Dictatorship, 1975-82," *EIR*, July 27, 2001.

nation-state republic is premised. Second, there is the matter of the conduct of legislation under that principle of law.

On the first point, the modern sovereign nation-state republic, as defined according to Nicholas of Cusa's *Concordantia Catholica*,⁵⁰ was the belated liberation of European civilization from the bestial tradition of the ruling oligarchies of Babylon, Delphi, ancient Rome, and feudalism.

Under all those earlier and like systems, humanity was composed essentially of four classes. At the top, a ruling oligarchy. Immediately below, a class of lackeys, those "Leporellos" of the oligarchy, who imposed the will of the oligarchs upon the mass of humanity.⁵¹ Below the lackeys, were those treated as human cattle, either as cattle to serve the oligarchs and their lackeys, or as wild cattle, to be hunted, and either killed or enslaved at the oligarchs' pleasure. Increasingly, during the recent three decades, as Figure 1 reflects but a part of this, the lower eighty percentile of U.S. family households has been degraded to the political status of virtual human cattle, political cattle begging for favors from "the establishment," through that begging posture sometimes referred to as "go along, to get along."

With the Fifteenth-Century establishment of the first modern nation-states, France under Louis XI and England under Henry VII, a new form of society was defined in practice; a society in which the moral authority to govern, was conditional upon the government's obligation to promote the "common good," the "general welfare," of all of the population and its posterity, and the improvement of all of the territory over which it ruled. Notably, steps in that direction had been attempted earlier, under the influence of Abelard of Paris, Spain's Alfonso Sabio, the Stauffer Emperor Frederick II, and the efforts of Dante Alighieri; but, the imperial maritime power of Venice, which had dominated Europe and the Mediterranean during those centuries, had drowned these efforts in Crusades and other wars.

Admittedly, there was a prolonged, pro-oligarchical reaction against the Fifteenth-Century reforms, especially during the Venice-instigated, 1511–1648 interval of religious wars. The situation was such, that the first modern nation-state republic was founded in the U.S.A. in 1776–1789, an achievement inspired, and aided by many other leaders and nations of Europe as a whole. Since the 1789 adoption of the U.S. Constitution, globally-extended European civilization has been dominated by conflict between the cause of such sovereign nation-states and the opposing forces of those who look back to medieval imperial Venice, and to both imperial Rome and that feudal system which was based chiefly upon the Romantic precedents of the Code of the Roman Emperor Diocletian.

⁵⁰ Nicholas of Cusa, *The Catholic Concordance*, Paul E. Sigmund, trans. (Cambridge, U.K.: Cambridge University Press, 1991).

⁵¹ See Wolfgang Amadeus Mozart, *Don Giovanni*.

Notably, the opponents of a society based upon the principle the general welfare, include such forces of disorder as the hands behind the 68ers, the Baader-Meinhof and Red Brigades terror of the 1970s, the radical violence of the mid-1980s, and today's followers and fellow-travellers of the Teddy Goldsmith who, since Seattle and his conference in Pôrto Alegre Brazil, has played a notable role in unleashing the veteran leaders of the 1968, 1970s, and 1980s terrorist rampages with new followings, for the purpose of destroying both the modern nation-state and the economy upon which the continued existence of most of the world's population depends.

Such so-called "terrorist," and related rampagers, are like the Flagellant hordes of the Fourteenth Century, the religious warfare of the Sixteenth and Seventeenth, or the mobs deployed by that Jacobin Terror which brought the first fascist dictatorship, that of the Romantic "Caesar" Napoleon Bonaparte, to power, the dionysiac instruments of destruction intended to foster the chaotic conditions under which oligarchies can consolidate their rule through the impact of such depredations on the orderly institutions of republican society.

The principles of law of modern civilized society, notably the constitutional law of the U.S.A., can be understood only against that historical background. Examine the issues of health-care policy accordingly.

The functional superiority of the 1776 U.S. Declaration of Independence and 1789 Constitution, over most of the world's constitutions established since, is their relative simplicity. They are statements of governing principle, rather than the tedious, often self-contradictory lists of prescribed do's and don't's, which are mistaken for constitutional law in many other cases. The advantage of the U.S. constitutional law, over such rivals as the tradition of British Common Law, is that, if and when we of the U.S. follow those constitutional notions of law prescribed by our patriotic American intellectual tradition, we are obliged to base our decisions upon discovery of truthful applications of a modest handful of principles, such as constitutional law, to the case before us. Such is the genius of the adoption and application of the Hill-Burton Act.

The most efficient way to look at this superiority of the character of the U.S. 1789 U.S. Federal Constitution, over other notable modern constitutions, is to define the differences from the standpoint of the Christian Apostle Paul's famous *I Corinthians, 13*, in which the essence of the law is the Platonic notion of *agapē*, rather than an array of many "do's and don't's." Another way of viewing that difference in quality among constitutions of republics, is to emphasize that the notions of constitutional law, and law in general, ought to be the same notion of universal principle which we apply to a proper quality of physical science. In other words, it should be an historically specific form of expression of what is known in Classical tradition as *natural law*.

The unlawfulness of the use of the HMO act to repeal Hill-Burton, is most readily recognized from the standpoint of that conception of law which informed the shaping of the U.S. Declaration of Independence and Preamble of the Federal Constitution.⁵²

A constitution, and the law derived under it, should be a living quality of open-ended array of universal physical principles, as I have defined such an implicitly Riemannian manifold here. This should be compared with the effect of taking Plato's dialogues as a whole collection, viewing this collection as the unfolding of a series of successive discoveries of universal principles, each according to that principle of a Socratic dialogue echoed as Cusa's *docta ignorantia* and *coincidence of opposites*, and Leibniz's *Analysis Situs*.

We never know the totality of truth, but we are, nonetheless, accountable for truthfulness, especially respecting issues of principle. Thus, once we had discovered a valid universal physical principle, we are morally accountable for the practical import of that knowledge.⁵³ Thus, to violate a discovered principle, or its corollary, is a far different thing, morally, and under law, than to act in reasonable ignorance of that principle prior to the time it has been discovered. The same is true of those discoveries of principles of statecraft, or of artistic composition, which have been validated by a standard comparable to universal physical principles.

Here lies the superiority of law practiced according to the patriotic American intellectual tradition of Franklin, Hamilton, and Presidents Washington, Monroe, Quincy Adams, and Lincoln, over that morally corrupt, pro-oligarchical teaching and practice of law, which latter is typified by the Scalia-led, American Tory majority of the current U.S. Supreme Court.

Once experience and progress had shown the Hill-Burton policy to have been a solution to the problem of meeting the U.S. constitutional obligation to promote the general welfare, it was intrinsically unlawful to adopt legislation which clearly violated the intention of the successfully practiced Hill-Burton legislation. Clearly, the "shareholder value" and other Confederacy-looking decisions of the Scalia Court are intrinsically anti-constitutional, and therefore intrinsically unlawful precedents to be corrected at the first opportunity.

Before turning to the issue of energy policy, we could not understand the issues implicitly posed by such changes in medical policy, unless we took into account other aspects of recent international trends toward promoting increased morality rates in populations. It will be made obvious, immediately following these next remarks, that the exact same principles presented here apply equally to energy policy.

⁵² As several of my collaborators, and other authorities, have pointed out, the key to recognizing the essential quality of evil pervading the Constitution of the treasonous Confederate States of America, is to contrast the Preamble of that Constitution with that of the Federal Constitution of 1789.

⁵³ Compare U.S. Supreme Court Justice Jackson's Nuremberg doctrine of "knew or should have known."

The Economic Issue of Health-Care Policy

Look at the U.S.A. case of Hill-Burton vs. HMO policy, as typical of the problems within a broad array of related matters arising around the world, including kindred issues of public education policy.

When we lessen the relative longevity, health, and intellectual development of the population in general, we are lowering its per-capita productive potential. When we divert resources to activities such as increase of the actually unearned financial capital gains of stock-holders, we have not only violated the principle of equity expressed by the "general welfare clause" of the U.S. Constitution;⁵⁴ we have injured the economy as an economy, as well.

There is more than the already important legal issue of equity involved in this; there is also a crucial issue of measurement of economic growth, or decadence. The benefits of Hill-Burton practice, typify a contribution to the potential relative population-density of the U.S. population as a whole. Therefore, reversing those contributions, is a deduction from the true national income of the U.S.A. In honest national-income accounting, that loss must be charged against those who have fostered, and implemented such decadent changes in practice. That loss occurs in a form which is only typical of the kinds of effects of primitive accumulation to which Academician Lvov has referred.

The function of the predatory HMO legislation, has been to loot wealth from the living bodies of the majority of the U.S. population, converting the victims' suffering and accelerated death-rates, into increased profits for those speculators, including close associates of the current President of the U.S.A. who are most zealous in defeating any legal checks against such mass-murderous robbery. Moreover, the included effect is to lower the net physical productivity of the U.S. and its population, thus robbing not only the living, but future generations, for the great unearned pleasure of the "carpetbaggers" who loot under provisions of the HMO policy.

This is only the same practice of primitive accumulation which the Nazis practiced at locations such as Auschwitz. So far, the intensity of crime has not reached Auschwitz levels, but it is moving in that same direction.

The most significant of the effects of such immoral acts as the U.S. shift away from Hill-Burton, is the effect on the conception of the nature of the human individual. Compare the

⁵⁴ There is an implicitly obvious importance in maintaining a supply of healthy, culturally developed grandparents in the fostering of the moral and productive potentials of minors. The reduction in cardiovascular capacity of persons over sixty-five or seventy, does not mean that those persons have ceased to be important for the prosperity of the economy; there are other functions for which they are more or less indispensable, and would be contributors, but for the modern real-estate and related practices which destroy the valuable role of the extended family in the cultural nourishment of the young.

way in which some legislation and HMO practices, for example, use financial-accounting and actuarial arguments to withdraw medical support in cases in which the assistance is withheld on the presumption, that it is "no longer needed" for the subject person's gainful employment!

As I have just noted, above, such withholding of health-care, is a step in the same direction as the Nazi government's policy of "terminating lives unworthy to be lived." Such policies, if continued, are the first steps toward what later happened at Auschwitz, and must be seen in light of the recent mass slaughter of cows and sheep in the United Kingdom, and elsewhere. Notable, is the plainly sheer, shameless malice expressed in that policy of practice.⁵⁵ There is no scientific basis for it; in fact, it defies all previously established, proven policies for dealing with such infections.

In that practice, in which the British monarchy is only the most conspicuous offender, cattle deemed even merely potentially susceptible to infection with hoof-and-mouth disease, are slaughtered as if they were unwanted human inmates of the Nazis' Auschwitz.

Notable is, that the pretext for this slaughter of the innocents, is that the British monarchy, among other states, has elected to ban relevant vaccinations and related prophylactic policies, not only in their own nations, but to impose international codes to the same effects upon others.⁵⁶ Notably, in the U.K., this is being done under military-emergency procedures, involving sundry resources of the state which are under the coordination of, not the Parliament, but, rather, the royal Privy Council.⁵⁷ More and more, the proffered pretexts, are to eliminate much of the food supply of the United Kingdom itself, in order to promote dependency on selected foreign sources of foodstuffs!⁵⁸

Worse, already the idea has been circulated, through international mass-media, that, in the case of certain kinds of human epidemics, exactly the same sorts of "prophylactic" precautions would be taken against human populations, which are presently being practiced

⁵⁵ See interview with Brig. Alexander Birtwistle, "Man or Superman?" *The Observer*, April 8, 2001; Stuart Wavell, "Will Flu Be the Human Foot-and-Mouth?" *Sunday Times*, April 22, 2001. For background to the news, see Mark Burdman, "Is Britain Preparing a Future 'Human Cull'?" *EIR*, May 4, 2001.

⁵⁶ "Hoof and Mouth Plague Grows: Again, Globalization Kills!" *EIR*, March 9, 2001.

⁵⁷ The London *Guardian*, April 14, 2001, described the militarization of the battle against hoof and mouth disease, and quoted Brig. Malcom Wood, second in command of the operation, saying: "Nothing I have been involved with, including the Gulf war and Bosnia, compares to this." The first in command was Brig. Alexander Birtwistle, who had served in Africa, Northern Ireland, and Germany.

⁵⁸ British Prime Minister Tony Blair in a speech in Brazil, quoted in the London *Guardian*, July 31, 2001: "Blair declared that 'the big prize for countries like Brazil' would be for their agricultural products to move freely into Europe, and to end the elaborate price-support system for European agriculture." He spoke about "phasing out price supports" for European farmers, and putting "European farming on a truly sustainable footing."

against cows and sheep.⁵⁹ In England, that would mean a virtual suspension of parliamentary government, while the Privy Council's resources are mobilized for a dictatorial prophylactic reduction of much of the population of the British Isles, obviously including Ireland in the enterprise.

The point to bear in mind, is that the oligarchical view of the generality of the human species, is that the majority of the population is merely a form of human cattle. Such individuals are, therefore, likely to be slaughtered when their existence is offensive to the oligarchs, as if such victims were pests, or culled from the herd when their continued existence is considered economically burdensome. This is precisely the axiomatic assumption intrinsic to the recent arguments for closing Washington, D.C.'s only public full-service general hospital, D.C. General. That is the same axiomatic assumption applied under the HMO doctrine, and also related court rulings and legislation.

In such cases, the notion of "human rights," has been replaced by that branch of financial-accounting practice best named "human rites."

Take the case of the *Washington Post*-led scheme of Washington, D.C. real-estate speculators, the plot to close the D.C. General Hospital. The Nazi-like pretext for the closing of that hospital was argued, chiefly, as follows.

The argument was, that we must, as Vice-President Al Gore demanded that President Bill Clinton bend to Newt Gingrich, accept the scrapping of the Federal Constitution's "general welfare clause," for the sake of what Gingrich and Gore defined as "fiscally responsible" policies. This means, inclusively, the "privatization" of health-care; that, to the intended effect of enriching the financial speculators who have taken over health insurance programs, HMOs, pharmaceutical, and related programs.

Once that Gingrich-led change in U.S. national policy was made, what was then deemed necessary to maintain the profits of the shareholders ("shareholder value"), now governs who lives, and who dies. The argument is, that since D.C. General is a publicly funded institution, it must be privatized, and its assistance to those dependent on a public institution for their very lives, cut off. In short, kill the poor for the sake of the financial speculators engaged in takeover of health-care functions, and also for the sake of the real-estate speculators who intend to reap vast financial capital-gains from real-estate speculation in the area of Washington, D.C. in which D.C. General is intended to be razed.

Perhaps inevitably, many of those who support such measures with full consciousness of the consequences, such as Washington's Eleanor Holmes Norton and her confederates, have sought to pass themselves off as the most self-righteous of the public officials of the nation's

⁵⁹ See footnote 55.

capital! Their arguments to that effect have not been plausible ones, but they have been, nonetheless, energetic.

With precisely such measures of "fiscal austerity" as those, great empires undermine and destroy themselves. Not only does the attitude of those such as Eleanor Holmes Norton represent a disposition to promote crimes, such as those against humanity; any nation which applies such policies as those of Gingrich, Gore, and Norton, against their own people, will ultimately destroy itself by its own hand. The principle underlying that syllogism is elementary.

The implication of such policies as those of Eleanor Holmes Norton, is that she does not appear to know a distinction between a human being and an animal. The effect of her actions, is to degrade the relevant citizens of her Washington, D.C. to mere units of accounting, as the Nazis' accountants before her referred to the inmates of concentration-camps as "pieces."

Among her notable failings on this account, she seems to have no efficient comprehension of the way in which actual human beings are properly reproduced. She manifests no comprehension of the fact that human beings, unlike animals, are creators and transmitters of that class of ideas typified by experimentally validated discoveries of universal physical principles. Therefore, in her obsession with matters peculiar to passions of personal greed and animalistic pleasure-seeking, she does not take into account the indispensable function which the seriously ill, the crippled, and the aged, may, and often do contribute to society by simply continuing to live and function as members of society. This includes an extremely significant economic function.

As in the case of Hitler's use of slave-labor extermination camps, the intention of the actions defended by Eleanor Holmes Norton is to salvage new income for the ruling interests by looting the bodies of the doomed. Such were the clearly expressed financial motives behind the effort to shut down D.C. General. The financial motives were two: first, to promote the looting of the health-care system by predatory financier interests, as in HMO practice generally today; second, to clear the way for what is intended to be a bonanza of real-state speculation along the Washington, D.C. banks of the Anacostia River. Such measures may not have arrived at Hitler's Auschwitz yet, but they are moving down that road.

The applicable reference on this point, is my discussion of the implications of *The School of Athens*. The relations within the family, are the pivot on which the nurture of the child's sense of cognitive relationships and functions normally depends. The sense of the extended family, is usually crucial on this account, especially the sense of the child's own parents and grandparents. The moral development of the child, including the sense of being a member of human society, depends upon the degree to which the child sees social relations in terms of

the cognitive generation and replication of universal physical principles (as I have defined these above).

For example, in my own experience, growing up in the U.S.A., the most significant set of events was the great Civil War of the 1860s. My maternal grandparents were born during that time. Already in pre-school childhood years, a sense of history, for me, was intermeshed with discussion of the experience of the period of my great-grandparents and great-great-grandparents' lives, with the struggle to end slavery, as slavery was fought against among the dominant recollections of those forebears' concerns and efforts during their adult lifetimes.

Also, in my youth, as earlier, and among a significant portion of the children and adolescents I knew from the post-war decade, the idea correlated with the significance of the child's grandparents and great-grandparents was the child's identification with an idea referenced by them as what "I intend to become when I grow up." Many among my readers must have had a comparable experience.

Such conceptions of immediate social relations, when coupled with a significant amount of cognitive exchange across generations, afford a developing child and adolescent some significant sense of the functional meaning of one's place in a "simultaneity of eternity."

As a practical matter, both the motivation and ability of the individual to assimilate, generate, and employ discovered universal physical principles, depend significantly on the degree to which that sort of multi-generational sense of personal cognitive identity, is developed during childhood and adolescence. The child's and adolescent's sense of relations consistent with that, within the extended family and community, is of great functional importance in this respect, as is the mode and content of the education and cultural activities afforded in school and other settings.

Even from the standpoint of the most piggish sort of financial accountant's sense of what is of practical importance for the economy, these social considerations are determinants of relatively overriding importance in fostering the potential productive powers of labor of the society as a whole. By "productive powers of labor," we should understand not only skills, but also motivation.

Scientific and artistic creativity alike, depend upon a quality of playfulness specific to human beings, as distinct from a parallel quality of playfulness among animals. It is the role of playfulness in the cognitive processes of the individual, which are of crucial importance at this immediate point in my report. The kind of playfulness which leads, through laughter, to valid new hypothesis, and to implementation of useful innovations, is the foundation of productivity in the member of the labor-force. That is the crucial factor of motivation, on which the successful fostering of productivity depends.

This is what we should include prominently, in any attempt to define a useful meaning for the term "quality of life." It is that matter of quality of life which is at issue in the matter of setting general health-care policy, as in education; the only thing which is more important than that, on this account, is the conveyed perception, by the society, of the society's sense of moral and functional responsibility, on this specific account, on account of a sense of the general welfare. It was that which, most conspicuously, Gingrich, Gore, and Holmes Norton lacked.

Now, turn to the example from recent decades' turns in U.S. energy policy.

Degeneration in U.S. Energy Policy

From very early in the colonization of North America, already, as in Winthrop's Massachusetts Bay Colony of the mid-Seventeenth Century, the notion of the development of the total infrastructure of the continent was a governing impulse. Foolish historian Turner's emphasis on a "frontier" orientation,⁶⁰ not only misses the point, but expresses a pro-Confederacy bias, consistent with the pathetic ideology of such latter Nashville Agrarians of Tennessee, as Henry Kissinger's Professor William Yandell Elliott and manufacturer of violence-prone religious cults, John Crowe Ransom.⁶¹

The early settlers of Massachusetts, Virginia, and Pennsylvania, were not so silly as to embrace the Bogomil-like, *laissez-faire* superstitions like those of Physiocrat Quesnay. From the beginning, within Winthrop's Seventeenth-Century Massachusetts itself, the condition of the immediate environment at hand, was recognized as the foe to be conquered. For them, the natural condition of the environment, was not the source of wealth required; that wilderness environment must be transformed from what it was, into what civilized life required it become.⁶² Transforming the barren wilderness into fertile farms, and developing the manufactured tools to bring this about, was the theme of the American colonization from the beginning, through, and beyond the time this policy was articulated in Treasury Secretary Alexander Hamilton's December 1791 Report to the U.S. Congress ***On the Subject of Manufactures.***

In that connection, it is relevant here to emphasize, that at the time Hamilton wrote that report, the per-capita productivity and income of King George III's United Kingdom was approximately half that of the young United States. Even the development of the beginnings of the United Kingdom's industrial revolution, in mid-Eighteenth-Century England, like the

⁶⁰ Frederick Jackson Turner, ***The Frontier in American History*** (New York: Dover Publications, 1996).

⁶¹ Stanley Ezrol, *op. cit.*

⁶² H. Graham Lowry, ***How the Nation Was Won: America's Untold Story*** (Washington, D.C.: Executive Intelligence Review, 1988).

development of Isaac Watt's steam-engine, was chiefly under the inspiration and guidance of America's Benjamin Franklin.⁶³

In the development of the U.S. to become the economic giant it emerged to be over the course of the 1861–1876 interval, the early development of roads played an important, but, strategically speaking, subsidiary part. It was the development of water-management, then railways, and increasingly energy-dense modes of generation of power, leading into the electrification which spread from the U.S.A. into Europe, which was strategically crucial for the development of the continental United States as a leading economic power in the world.⁶⁴

The success of the U.S. economic development over 1861–1876 was under the influence of President Abraham Lincoln and the world's leading economist of the period, Henry C. Carey. It was that 1861–1876 experience, which, beginning approximately 1877, prompted Bismarck's Germany, Czar Alexander II's Russia, Meiji Restoration Japan, and others, to adopt the Hamilton-List-Carey model of the American System of political-economy. As in the case of scientist Mendeleev's leading role in developing the transcontinental railway system of Russia, and fostering accompanying industrial development, the American model was on the road to transforming the world, had the *Entente Cordiale* of Britain's Prince of Wales and later Edward VII not intervened to launch the first Sino-Japanese war, the conquest of Korea, and the Russo-Japan war of 1905. Edward VII and his *Entente Cordiale* then launched the Balkan wars which preceded August 1914. and mobilized his "geopolitical" World War of 1914–1917, all in an effort to stop such economic cooperation throughout Eurasia.

See the issue of the modern development of basic economic infrastructure against that background.

During the course of the Nineteenth and most of the Twentieth Centuries, most of these strategically decisive contributions to the development of U.S. basic economic infrastructure, were associated with the role of the West Point military academy and its graduates. Large-scale water-management systems, culminating in the great Tennessee Valley development under Franklin Roosevelt, the transcontinental railway system earlier, and electrification, are typical of the foundation upon which the U.S.A. rose to world leadership as an economic power.

This development of such and other basic economic infrastructure, was accomplished chiefly through a combination of actions, partly by the Federal government, with a complementary, supporting role supplied in the division of labor by the governments of the states and

⁶³ Anton Chaitkin, "The Franklin Circle Starts Modern England," *EIR*, Feb. 9, 1996.

⁶⁴ Lowry, *op. cit.*

localities. Without such government initiatives and government regulation, these developments would neither have occurred, nor survived. Later, under Nixon and Carter, these great improvements in basic economic infrastructure began to be driven out of existence; the economy slid into an accelerating, systemic collapse, largely as a result of those measures of privatization, "fiscal austerity," and deregulation set into motion under Nixon and Carter.

In the pre-Nixon-Carter progress of the Twentieth-Century U.S. economy, electrification, launched by Edison *et al.* from inside the U.S.A., and by Emil Rathenau *et al.* in Germany, contributed a distinctive role.⁶⁵ The impact of development of the electrical motor began to revolutionize U.S. industrial productivity even prior to World War I. Even during my adolescence, two decades later, and, in notable instances, even somewhat after that, there was still extensive, if dwindling use of steam-powered, belt-and-shaft transmitted power in use in U.S. factories. The increase in productivity effected through using individual electric motors, instead of belt-and-shaft transmission of steam-power, to drive machinery and operating equipment, was an economic revolution.

The significance of electrification is sometimes described by a term for a concept borrowed from a follower of Rutherford: *energy flux-density*. This signifies power transmitted through an area measured in square centimeters in cross-section, *per second*. It is a very useful term, better than most used for measuring energy-production and transmission, if not taken too literally. The vast advantages for production and technology as such, by replacing so-called traditional sources of power by nuclear-fission power, going on to the vastly more advantageous nuclear-fusion power, and reaching on in hope of mastery of what are termed matter-antimatter reactions, reflect the importance for productivity, and also human survival, of increases in the equivalent of energy-flux-density of primary sources of energy.

Since the inauguration of President Jimmy Carter, the primary energy sources in the U.S. have degenerated through attrition. Without the general collapse in agriculture and industry which has occurred during the recent quarter-century, thus reducing consumption-requirements far below what they would have been otherwise, waves of blackouts of large sections of the nation would have hit with terrible force long ago. This ruinous situation has been exploited, to enable purely parasitical financial speculators to take over and loot both much of the industry in power generation and distribution, as the California case illustrates the point, and to threaten the security of the nation and its population in related ways.

In other words, a clear-cut case of purely predatory primitive accumulation.

⁶⁵ The foundations for Edison's successes had been laid by the American scientist Joseph Henry, and fostered through the international role on behalf of the U.S.A. by Benjamin Franklin's great-grandson, Philadelphia's West Point graduate Alexander Dallas Bache.

During times "Before Carter," when the U.S. was still a functioning economy, agriculture and industry were extremely sensitive to two external factors: borrowing costs, and energy prices. U.S. Secretary of State Henry A. Kissinger's role in the London Petroleum-Marketing cartel's orchestrated oil-price hoax of the mid-1970s, brought this connection home to the American family farmer. High petroleum prices, combined with the "controlled disintegration of the economy" orchestrated by Carter-appointed Federal Reserve Chairman Paul Volcker, were a devastating blow from which, related other factors also considered, the post-1930s, modern form of technologically progressive American family, and intra-family farm and its farm-system has never recovered, to the present day.

For such combined reasons, the U.S. economy has the following, critical problems today. These problems are typical of problems throughout the world at large.

A modern agro-industrial economy requires government to treat the matters of the production, delivery, and price of energy, in much the same way we treat the requirement of safe drinking water, or the maintenance of a public health system capable of effectively addressing threats of epidemic disease. While we must isolate regional generating and distributing systems from one another, for reasons of economic safety and national security generally, we require the net effect of a coordinated system of integrated generating and distributing grids, for the national territory as a whole.

The supply of power must meet publicly-determined standards, must be reliable, and must have the stable, non-fluctuating price consistent with the needs of communities, agriculture, industries, and the development and maintenance of other essential categories of national infrastructure. Experience has proven, that the best arrangement for this, perhaps the only allowable arrangement, in the final analysis, is the well-regulated system of public utilities which had been developed in the U.S.A., western Europe, Japan, and elsewhere, prior to the recent rampage of that form of economic lunacy known as deregulation.

"Publicly determined standards" must include provision for improvements in the mode and quality of production of energy-supplies. Such power is as necessary, universally, and more or less as consistently, as safe tap-water and sanitation. Moreover, the manner, quantity, and form in which it must be generated and distributed, must be modified in ways which anticipate changes in productive and related technologies before those latter changes can be put into general effect. The deregulation of energy production and distribution makes about as much sense as a government's dissolving its national defense capability, and, in place of its own military forces, taking bids from private contractors from various parts of the world, in the case war might break out.

The need for such a public energy policy rests upon the same types of considerations as those applicable to general education and sanitation.

On these, and related accounts, the healthy form of modern economy combines three elements. First, a very large government-operated, or regulated sector, chiefly concentrated in the unshirkable responsibility of the sovereign nation-state for things affecting the welfare of all of the people and all of the area of the nation. Second, private entrepreneurship in agriculture and industry, with preference for actual entrepreneurship over financier-controlled corporations. Third, a well-regulated currency, banking, and financial sector, to assist in creating a well-ordered environment for the other two areas of responsibility for the economy as a whole.

In that three-fold division of labor, the distinctive function of the privately-owned sector, is the entrepreneur's risk-related role in promoting the development and use of new scientific principles and technologies, and the related work of innovations in both product designs and design of productive processes. Hence, a prudent government arranges preferential treatment for such entrepreneurial organizations, over financial-market-controlled corporations, especially large ones in which financier interest and bureaucracy combine effects, to tend to suppress the rate of progress.

Failure to establish and implement such energy policies, must result in regressive primitive accumulation against the future of the nation as a whole.

2.1 The Costs of Production

I begin what is to be said at this point, with a brief restatement of crucial points made thus far.

Whenever we hear it said, as a prevalent expression of official, or popular opinion, that a nation has come to regard its customs as "finally settled," and when that people has been seized by the folly of degrading their definition of morals chiefly to a bucketful of utopian "single issues," let us tremble in pity for that unfortunate nation. Unless it removes such errors from its present opinion, and does that in a timely fashion, the nation is doomed, sooner or later, to some horrible experience, which it will have brought upon itself. So, the empires of Mesopotamia, like Rome and Byzantium later, each in their turn, died in the sands of a virtual desert which they had made their tomb.

So, during the second half of the 1960s, the United States chose to bring itself, and much of the world besides, over the long term, to that kind of ruined physical, moral, intellectual, and financial condition in which we find it today.

In the U.S. itself, this culturally suicidal impulse, assumed the form of an expressed hatred against the American intellectual tradition of agro-industrial scientific and technological progress, a tradition which those who mourned for the slaveholding Confederacy saw, and

hated, as the heritage of President Abraham Lincoln. So, the anti-industrialist decadence expressed by those heirs of the Confederacy known as the Nashville Agrarians, exemplify the utopian moral degeneracy which has come to dominate the U.S.A. increasingly, since the triumphs of the "Southern Strategy" of Presidents Nixon and Carter.

That is the essence of that folly which has brought the consequently decadent U.S., and also the world, to its present state of ruin.

That folly is expressed most efficiently, by the implications of that ominous slogan, "zero growth," a pathetic notion which became widespread among an emerging adult generation, initially among its overlapping "leftist" and university campus populations, during and following the second half of the 1960s. The ensuing introduction of utopian policies which would bring toward an end the process of increasing mankind's per capita power in and over nature, has brought about the present state of planetary ruin.

Just as life has imposed a self-developing biosphere upon an ostensibly abiotic Earth, and as mankind has transformed that biosphere in ways which have greatly increased our species' potential relative population-density, so, the law of the universe remains, contrary to the cult of "zero growth": *progress or be doomed*. Were the world to continue to allow itself to be ruled by the combined policies of "zero growth," "free trade," "deregulation," "globalization," and kindred utopian fads, the whole of civilization is being brought close to extinction, by its own hand. Such are the typical characteristics of a systemic crisis of civilizations.

So, those earlier cultures which adopted what were either explicitly, or in fact, "zero growth" policies in fact, were each self-destroyed in their time. So, ancient Rome and Byzantium of the Code of Diocletian destroyed themselves, by what became their reigning popular culture, as we today threaten to destroy ourselves by our own.

A universal law of "Progress or Doom" reigns with the fiercest tenacity over the universe's finest species, mankind. A culturally stagnant human species, is a contradiction in terms. We, as a species, are able to progress as no other species can; we are, at once, blessed and burdened by the possession of that unique nature. When we are sane, we accept that special feature of our nature and destiny. From that fact, we ought to impose appropriate policies upon our society. For truly sane men and women, for sane cultures, such impositions are the underlying laws which must define a nation's and our planet's commitment to endless scientific-economic progress.

The function of sane government, is to meet that requirement. It must do this, by developing those habits of innovative policy-shaping by which this requirement is met, now, and, hopefully, by the future generations to which we, in our time, bequeath that same commitment.

At all times, in making national, and also international economic policy, the morally obligatory object, is to increase the useful output of the economy, per capita and per square kilometer, while also, simultaneously, raising both the standard of consumption and the rate of physical-economic growth of output over current consumption. This means that we must increase the *anti-entropy* of the economy as a physical process. This signifies an increase of that anti-entropy in absolute, physical terms.

In this second section of the present chapter, I shall now address certain crucial implications of the point, that this increase in output can be sustained only through the effective equivalent of a top-down, science-driver policy for the society as a whole.

As I have said, the only possibility of maintaining and increasing the anti-entropy of mankind's, or a nation's relationship to the universe, is through the realization of valid discoveries of universal physical principles, as I have defined such principles in the course of this report so far. On this account, *the promotion of scientific progress in such discoveries, and the organization of society in those ways needed to transform discoveries of principle into effectively applied improvements in technologies of both productive processes and product design, is to be adopted as the necessary, underlying intention of society as a whole, and government in particular.*

Otherwise, entropy, doom, takes over.

For that purpose, we require, presently, urgently, a certain improved way of thinking about both present and future policy-shaping. It is not sufficient to conquer only those obstacles which lie immediately before us. We must be certain that we are laying the foundations for those successful innovations in policy-shaping measures, which are to be introduced by those generations which come after us.

Look at the challenge of primitive accumulation from this standpoint. Look beyond the policies needed to get us through the next quarter-century or so; consider the improved kind of policy-shaping institutions needed, now, to equip those who follow us to make the long-range policies they, in turn, must craft and adopt in their time.

What Should We Mean by 'Linearity'?

The implication of primitive accumulation, as Academician Lvov has posed this in his terms of reference, is that there exists a relevant, included, special element of cost, which must be met if society is to sustain the level of anti-entropy of an economy over the medium- to long-term; an element of cost which lies outside what prevalent cost-accounting practices have heretofore acknowledged. The implication is, that were this specific quality of cost not to be met, something unpleasant would happen to that society in the long term, more or less inevitably, as now.

The implication of Lvov's warning, is that this consideration should prompt us to change our nations' heretofore prevalent method of accounting, in such a way as to take those indicated, longer-range causal connections into account. This means that we must, among other duties, uproot certain among the most widely accepted current assumptions of accounting practice in general, of academic economics, and of the practice of legislation as well.

Therefore, we should see, as typical of this needed change, the duty to uproot what this report has already identified as a presently commonplace blunder from secondary and undergraduate teaching of the calculus. I mean the blunder of viewing the differential calculus, as presently commonly taught, as if it were an epistemological foundation for the study of the integral, which it is decidedly not. The following clarification of that point is needed here.

If those who teach had properly learned their lessons, they would have recognized, first of all, that the uniquely original discovery of the calculus, by Gottfried Leibniz, depended upon the method of scientific discovery which Kepler had adopted explicitly from Nicholas of Cusa and Leonardo da Vinci. The challenge of developing a calculus, as first specified by Kepler, was not to derive an orbit from an interval of that trajectory, but, precisely the opposite: to derive the method for assessing the relatively short-term interval from a standpoint of comprehension of the long-range characteristics of the orbit as a whole.⁶⁶

The corresponding issue of long-range cost-accounting, is that the choice of variations in current expenditures must be based upon understanding the way in which long-term processes must be understood as determining the outcome of short-term effects: not as, as today's usual accounting and economics practice do, the other way around. A competent practice of national-income accounting, in particular, must be based on a grasp, like that of Kepler and Leibniz, of those qualitative changes in short-term behavior of the economy which would become, belatedly, visible to reductionist accounting practice only about a generation or longer later. Thus, on this account, both accounting and the calculus are usually taught and practiced "bass ackwards."

For example, in the matter of special long-term depletion, the lurking longer-term calamity is not taken into account in today's conventional estimates of necessarily incurred current costs. Thus, under the U.S. Nixon and Carter administrations, for example, the attrition in abandoned improvements in basic economic infrastructure were not reflected, as competent accounting practice would have done, as a deduction from the apparent gross national product.

The collapse of those elements of infrastructure, as typified by such examples as the past quarter-century's collapse of investment in maintaining required per-capita levels of price-

⁶⁶ E.g.: equal areas of areas swept, equal time.

regulated electricity supplies, was not charged against the government and financial interests as honest accounting would have done. That willful oversight thus led to the willful destruction of the future well-being of the economy and population as a whole.

Similarly, in household-income accounts, the abandonment of technologically more advanced modes of productive employment, with the consequent downgrading of the labor-force to lower levels of both productive skills and productive output, was not charged as a cost to that government and private enterprise which incurred them, which has become now a massive economic loss to the economy as a whole.

Such are typical of the mixture of willful malice and gross incompetence, which has been shown in both financial accounting practice generally, and in the teaching and practice of economics as well. It is those neglected margins of long-term costs, which prove to be determining factors in recent decades' accumulated gross economic calamities of societies.

A similar incompetence of the accountants and economists, pervades even the accounting of those categories of costs which they do acknowledge.

The issue of method here, is, again, the same issue posed by the fundamental incompetence which was shown by such as Euler, Lagrange, Laplace's Cauchy, *et al.*, in assessing the calculus. That incompetence, which is exhibited so nakedly by what I have referenced above as Euler's foolish argument against Leibniz's calculus, is the false assumption, that the interval of change, as to be measured in the very small, is to be represented essentially, as a straight-line pathway, as Cauchy later introduced his notorious "fraction" to the elementary teaching of the differential calculus. That issue of method is named, more precisely, the fallacy of assuming *linearity* in the "infinitesimally small."

Do not be deceived by the currently fashionable sleight of hand on the subject of linearity. Most of what are claimed to be "non-linear functions," in academic circles today, are either simply a sophist's frauds, or a more stubborn mental disorder best identified as that state of hysterical self-deception which should be recognized as the clinically psychopathological state of "denial." Let us get this issue out of the way, as briefly as decently possible, and thus free ourselves to proceed to our immediate main subject-matter here.

On the subject of absurd, currently popularized academic definitions of "non-linearity," consider the case of the game of chess as an example.

Chess, when considered as a board-game, is a closed, linear system. The manner in which Leonhard Euler defined, successfully, the formal-mathematical significance of the knight's move in chess, is a nice illustration of that point. Nonetheless, except for complexities of the frequent psychological warfare among the players, the game is, on the board itself, a fully linear system of that so-called "completed" quality, which Kurt Gödel exposed in his

thorough discrediting of certain wild claims by Bertrand Russell respecting both mathematics and mathematical physics.⁶⁷

As noted, Norbert Wiener and John von Neumann were, as a matter of fact, on the decidedly Satanic side of pagan religion, in their role as acolytes of Russell. Both were justly expelled from David Hilbert's Göttingen university, on grounds including stubborn and destructive incompetence of the type central to Russell's dogma. Most of the contemporary efforts to argue, that merely complicated algebraic, and other formal constructs are "non-linear" mathematics, is traced to these Russell circles, in which the work of von Neumann, of the mathematical "theory of games" fame, is most notorious. The origin and form of contemporary "systems analysis," is permeated with this influence.⁶⁸

As I have already stressed, all competent modern definitions of the distinction between linear and non-linear systems, are traced from the relevant work of Nicholas of Cusa, through such followers as Leonardo da Vinci, Kepler, Fermat, Leibniz, *et al.* However, the full meaning of the term "non-linear" for today, was not made fully transparent, until the successive work of Leibniz and such followers of his as Johann Bernoulli, Abraham Kästner, Gauss, and Riemann.

In competent teaching today, the resulting strict, correct definition of non-linearity, signifies the mathematical representation of those processes which can be competently defined only from the standpoint of an anti-Euclidean form of physical geometry. The crucial feature of that definition, is the effect of adding a previously unknown, experimentally validated discovery of a universal physical principle to our mathematical representation of the universe. The most convenient example, for our purposes here, is, once again, the step-by-step method through which Kepler, in his *The New Astronomy*, first defined the principle of universal gravitation.

Therefore, by "non-linear," I signify the effect of adding the impact of a newly added universal physical principle to physical geometry. This is a notion which was first clarified in

⁶⁷ Exemplary is a once-famous anecdote, treating an incident reported to have occurred during a match, from bygone days, between two grand masters, Lasker and Nimzowitz. Among the rules which the latter demanded be enforced during the match, was Nimzowitz's requirement that Lasker not smoke cigars during the match. Later, at some touchy moment in the match, Lasker pulled out a cigar, but without lighting it. Nimzowitz was alarmed, and called the referee's attention to this. To sum up what transpired, the referee observed, "But, he is not smoking the cigar," to which Nimzowitz responded, emphatically, "But, he threatens to smoke it!" Lasker, according to the anecdote, was notorious for the doctrine, that, in chess, the threat is more deadly than the attack. On the proof against Russell, see, Gödel, *op. cit.* The success of computerized chess-playing games attests to the indicated character of the game as of the type of a closed, linear system.

⁶⁸ Indeed, von Neumann introduced "systems analysis," during the 1930s, as an outgrowth of his earlier work, dating from the late 1920s, on the mathematical theory of games. He subsequently worked with Oskar Morgenstern, to produce their *Theory of Games and Economic Behavior* (Princeton, N.J.: Princeton University Press, 1953).

modern physical science, by the work of Leibniz *et al.*, in pointing to the *physical-geometric* principle of the catenary as superseding the earlier assumption, of Christiaan Huygens' design for his refined pendulum clock. This insight into the catenary freed the discoverers from the error of seeing the pedant's blackboard image of the cycloid as an adequate geometric basis for a notion of isochronic, or "least time" action.⁶⁹

In Riemannian physical geometry, there exist no universal physical principles, no definitions, axioms, or postulates, which are not such experimentally-validated discoveries of universal physical principle. It is the experimentally defined relationship among this multiply-connected aggregation of discovered parameters, which becomes, with Riemann's work, the modern working definition of *physical geometry*. The only event which corresponds to the notion of true non-linearity, is the effect of adding such "dimensions" to the correct recasting of a previously well-defined physical geometry. *The known real universe exists for us only as represented in the form of an uncompleted system of knowledge. Knowledge of the universe, scientific knowledge, is, therefore, a form of knowledge represented by what is defined as a formally incomplete system.*

The radically "ivory tower" geometry-arithmetic of Russell and his positivist followers, adopted the directly opposite view. That ivory-tower arithmetic pretends to outlaw the existence of any universal principles not already inhering in the notion of Russell's mathematics as an implicitly complete system. For Russell, as for the fanatical adherents of a strictly Euclidean geometry premised upon a set of *a priori* definitions, axioms, and postulates, as for Claudius Ptolemy's fraudulent, Aristotelean reconstruction of ancient Greek astronomy, physics is nothing but a bad boy's soiled imitation of what is worshipped as its proper master: "ideal," arbitrary reductionist mathematics at the blackboard.

Hence, from the standpoint of such a notion of a presumably complete system, as expressed by Euler, Russell, *et al.*, actually non-linear phenomena are arbitrarily denied the right to exist. Hence, a fraudulent notion of "non-linearity," as earlier argued by Euler, has been introduced to mathematics, in such guises as "information theory" and "systems analysis," by modern Russellite and kindred positivists, such as von Neumann.

From the standpoint of physical economy, the word "progress" has only two admissible, distinct mathematical meanings. That term is often used loosely, to signify almost any technical improvements in practice which have some durable benefit for either society as a whole, or the institution in focus. It is used more strictly to identify qualitatively beneficial changes in principles of practice, that in the sense of discovery of experimentally verifiable universal principles. It is chiefly the latter meaning on which attention is focussed here.

⁶⁹ It is of notable relevance, that the first recognition of the physical significance of the catenary, and its complement, the caustic, was by Leonardo da Vinci.

Science and Economy

With that now said, plunge into the crucial issue to be treated here. *What is the distinction between making an improvement, such as a discovery of a valid new universal physical principle, and the action which ensures that a beneficial, but presently unknown such discovery will be not only made, but beneficially employed by the coming generation of a society?* We have thus returned our attention to the subject of the equivalence between a universal physical principle and the *intention*, the latter the equivalence which Kepler, for example, associates with such a notion.

Since I have already prepared much of the needed ground for answering that question, I shall now go directly into the heart of the matter of practice this involves. *The answer is, that we must make the educational system, including its universities and associated fundamental research functions, the driving force for progress in the increase of the potential relative population-density of mankind as a whole.* This will not succeed, however, unless the educational policies of those institutions correspond to what I have presented, under the heading of a Classical humanist method of education, in the first part of this present chapter.

My argument unfolds as follows.

Every qualitative improvement in the productive powers of labor, requires the incorporation of an additional element of principle or technology in the current total cost of production.⁷⁰ To maintain progress, this added element of cost, must be more than offset by an increase in net physical productivity in the economy as a whole. This must be accomplished to such effect, that the added element of cost, as defined in absolute terms, does not cause an increase in the total cost of production, as cost is to be measured, after the fact, in percentile of resulting real output *of society as a whole*. Any different view of the way in which net physical-economic profit is generated over the medium to long term, is a false view.

For example, take the case of education of the labor-force.

To increase the productive potential of the nation's labor-force, there must be an improved production of ideas in the students, either during their academic studies, or as a later outgrowth of those studies. These are ideas as I have defined ideas here, as measured per capita for the population as a whole. The reasonable assurance that such a happy result will ensue, requires adoption of a Classical humanist policy of education, which demands those

⁷⁰ Think of this in the language of "process sheets" and "bills of materials." Think of relevant changes in operations performed, and of materials included, in terms of the technology they represent. Thus, think of a "cost" as an action, first, and a price assigned to that object second. Thus, as in Leibniz's development of his notion of a monadology as a higher version of his calculus, in the domain of experimental proofs, we must distinguish, as in microphysics, between the physical proof of the unchangeable notion of the existence of a specific quality of object as such, and the determination of the variable, mathematical expression of the functional existence of that object under differing sets of relations.

restrictions on class-size which the effective implementation of that policy requires in the classroom. It requires the relevant improvements in family and community life, which the notion of a climate of ideas, with emphasis upon cognitive ideas, demands. It requires, presently, a drive toward a universal higher education, with included increasing emphasis on experimental methods of proof of universal principles, both as pedagogical- and research-laboratory, and related activities.

The driver for the economy is then located in a specific overlap between the university's primary research programs and those aspects of the machine-tool sector of both university and economy, in which successful experimental designs are developed for test of hypothetical universal physical principles. It is the latter "machine-tool-design" interface, which integrates the continuing development of the industrial and related economic processes to the science-driver role of fundamental research as such. This interface pin-points the "science-driver" factor in the economy as a whole.

What I have described so, as the "science-driver" model of economy, is not in conflict with those notions of the American System of political-economy which are famously associated with the work of such opponents of the Adam Smith system as Hamilton, the Careys, and List. The difference is, that I have given a dominant institutional role to that which existed as clear implication in the argument of my American System predecessors.

What I have outlined here, is therefore a new design for the national economies of sovereign nation-states. Lately, we have been moving, at times, in that direction, during the war-time and aerospace science-driver mobilizations of the past century. The time has come to put together the lessons which we should have learned from those experiences. The most successful aspects of modern economy have been moving in the direction of such a change. The time to make that change in the institutional definition of national economy has come; the change is overdue.

The Costs of Productivity

These all represent costs incurred to produce a quality of result which is to be achieved in the rearing of the young, and also in the outcome, for society as a whole, of such a continuing process of improvements in education. They are real costs, which must be accounted as reflected in every aspect of production by that society. In addition, there are the increased physical-capital costs, such as those of basic economic infrastructure and production and distribution generally.

As I shall stress, a bit later here, this also signifies that certain kinds of clearly avoidable costs should be discouraged, for such purposes as conserving limited resources, in favor of a

standard of Classical humanist development of the cultural-artistic and productive activities in the population as a whole.

Now, focus upon the pivotal issue: the possibility of increasing the efficiency of production, that to such a degree, that increasing margins of output exceed the increasing costs incurred, *without resorting to the effects of using parasitical methods of primitive accumulation as a source of purely nominal, essentially fictitious profit. This indispensable gain can be obtained solely through the realization of scientific and technological progress, notably fundamental scientific progress. This actual, physical-economic gain is, by nature, a purely non-linear gain, as I have defined "non-linear" here.*

That is key to solving the problem which Lvov has addressed. Look at this, in the relatively simpler terms of illustration I have employed immediately above. I shall return to this at a slightly later point, to point to a more rigorous set of definitions.

Look at some aspects of the result of applying the criteria I have just summarized. In this strategy, we have both greatly increased educational allocations per capita, and have added, as a necessary cost of production for society as a whole, an increase of emphasis on fundamental scientific research, and upon related experimentally-driven development, far in excess of national-income-accounting standards of "fiscal responsibility" in force among nations today. To use a crude, but I think effective imagery, let us say, that in practice, we have defined education, if organized as I have described it here, as the "volcano" from which the directed increase of per-capita net productivity of the productive powers of labor flows. *In such a policy, we have chosen to make the generation of new, fundamental discoveries of universal principle, the driving force of national and world economy.* In short: a science-driver economy.

The point to be stressed here, as I shall focus upon that in more rigorous terms a bit later here, is that the generation of experimentally validated universal physical principles, is the only activity which produces net physical-economic growth in the economy. Therefore, that activity must be awarded absolute priority in economic policy-shaping. A science-driver model of economy is the natural expression of that necessary allocation of priority.

Such a policy has other significant effects, some of which should remind us of the fact, that the market for buggy-whips collapsed with the mass-production of the automobile. In competent accounting practice, we can not rely upon a simple form of so-called historical standard of cost. With changes in technology, the composition of the bills of materials and consumption, must adapt to the new technological environment.

Thus, by this consideration, reality once more confounds today's conventional accounting practice. As technological shifts occur in both the productive process and the design of products, the composition of the required bill of materials, process sheet, and human

consumption each and all undergo changes. These changes, whether in process-sheet, bill of materials, or household consumption, when considered as a whole set, are usually non-linear in character of their effect.

Hence we can not use a standard bill of consumption, or of a process sheet, as a so-called objective standard for comparative pricing of the long-term implications of incurred costs of production and consumption. The combined effects of that attrition and change in technology which inheres in the continued existence of society, preclude the possibility of use of a mechanical standard as a unit of account, for the purposes of any serious form of economic analysis of the process considered as a whole.

The only competent standard for economic measurement, is the notion of potential relative population-density, as I have defined this. As I have written, above:

“... the only possibility of maintaining and increasing the anti-entropy of mankind's, or a nation's relationship to the universe, is through the realization of valid discoveries of universal physical principles, as I have defined such principles in the course of this report so far. On this account, *the promotion of scientific progress in such discoveries, and the organization of society in those ways needed to transform discoveries of principle into effectively applied improvements in technologies of both productive processes and product design, is to be recognized as the necessary, underlying intention of society as a whole, and government in particular.*

“Otherwise, entropy, doom, takes over.”

To conquer the apparent difficulties which this notion of measurement of value incurs, we must proceed from the concept of a science-driver educational program, as I have described it here, as the cornerstone of all physical-economic measurements. *The only competent measurement of productivity is a measurement of the rate of increase of productivity relative to any level of potential relative population-density.* We must, first, choose the model of economy which yields the highest relative rate of long-term increase of such productivity, while defining incurred costs and expenses of such output, to be the ascertainable requirements for maintaining such a program. That obliges us to start from the educational system as I have summarily described it above. We must start from a science-driver conception of the education of the population as a whole.

Admittedly, such a view of economic policy as this has never been adopted explicitly. However, there are certain highly informative approximations of such an approach, notably in the science-driver programs motivated by preparations for, and conduct of, wars or kindred special kinds of science-driver enterprises.

I have proposed approaches to such science-driver programs in the past. The Eurasian Land-Bridge program, now in early phases of approach toward its implementation, is implicitly such a model of economic reform.

We have now reached the point to consider the issues posed by Nikolai Kondratieff, as I was first prompted to consider his work, during the course of the 1950s. From that point of reference, I shall return to supply a more rigorous restatement of the line of argument just outlined above.

Leontief versus Systems Analysis

The manner in which Academician Lvov has crafted his argument, can be recognized most readily from the standpoint of familiarity with the subject of Kondratieff Waves. Therefore, I include my own experience, and its view of certain among the effects of the work of Kondratieff, as these bear on the problem which Lvov has identified.

The transition from my initial discoveries, of the 1948–1953 interval, to functioning as a professional economist during the 1950s and beyond, were pivoted, as I have repeatedly emphasized so far, on my opposition to the twin follies of “information theory” and “systems analysis.” In the course of this continuing work, repeated, shocking encounters with the work of RAND Corporation, including RAND programs at MIT, and with the Operations Research Society, led me, in the course of the 1950s, to take the side of then-Harvard Professor Wassily Leontief, in his conflict with those whom he described aptly as those “ivory tower” economists then associated with Tjalling Koopmans, *et al.*

I had a single, very brief exchange of correspondence with Leontief during the mid-1950s. The included outcome of this crossing of paths, was my increased interest in the work of the Soviet economist Kondratieff, who had played a notable part in Leontief's own intellectual development during the 1920s; obviously, this association with Kondratieff had had some beneficial effect on Leontief's later work for the U.S. Government in developing the input-output accounting system used to estimate Gross National Product. I sought to understand how Leontief and I had come to converging views, by different routes, in our common abhorrence of the “ivory tower” notions then associated with what was called, interchangeably, “Operations Research,” or “systems analysis.”⁷¹

⁷¹ The connections among systems analysis, Operations Research, and the origins of the RAND Corporation and MIT's RLE, are notable here. According to official accounts, Operations Research was born in the United Kingdom, tracing its post-war origins to the circles of P.M.S. Blackett *et al.* during that war, overlapping the functions of airborne “strategic bombing.” This activity in Britain spilled over into the U.S. war-time and post-war U.S. military-intelligence establishment. With the post-war reorganization of the U.S. military establishment, this activity became lodged within the newly established U.S. Air Force and the founding of that arm's own newly created intelligence branch. These developments overlapped the continued operations of both the Unification of the Sciences project, co-founded in 1938 by Bertrand Russell and Chicago University's

Kondratieff Waves thus became an included special subject of my interest during the middle through late 1950s; a study I dropped during 1959–60, in the course of adopting my own present views on the specific quality of function represented by well-defined science-driver programs.⁷² I had concluded, by the close of the 1950s, that the importance of the class of phenomena characteristic of Kondratieff Waves lay more in the character of significant symptoms of certain wrong types of national-economic practices, than primary causal factors within a sound practice. The phenomena which Lvov has recently emphasized, are viewed by me as a demonstration of that point.⁷³

In brief, my argument on that subject, is that there are no inherently built-in Kondratieff Waves in a physical-economic process; but, rather, that for precisely the reasons given by the supporters of that view, effects like those attributed to Kondratieff Waves must occur when certain systemic errors in policy of practice in shaping economic policy, are prevalent in that society. My conclusion to that effect, should be recognized as clearly premised on the considerations which have led me to define a science-driver model of national economy.

In U.S. economic history, for example, such effects usually reflect swings between the relative influence of financier oligarchy and entrepreneurial interests, in shaping national investment and related economic and monetary policy. Like the fabled witch and children, in the case of the once popular household weather-clock, when the witch (financier interest) comes out, the economy is being looted, and the lamentable downside of Kondratieff Waves are to be expected; in contrast, when, for a moment, entrepreneurial impulses prevail over financier influences, the economic weather improves. The parasitical financier invests, like the parasite he is, in already proven technologies; the entrepreneur's instinct, as distinct from that of the executive of stockholder interest, is to create new technological achievements as rapidly as possible.

Robert Hutchins, and the "Cybernetics" operation conducted through the Josiah Macy, Jr. Foundation. All of these overlapping elements were brought together in a most significant way at MIT's post-war RLE. I studied these operations intensively during my work of the 1948–1953 interval, chiefly as a matter of "adversary interest;" I soon found them extremely interesting, but nasty adversaries of the American intellectual tradition.

⁷² I did not take up the subject of Kondratieff Waves again, until my first meeting with my dear late friend, Professor Taras V. Muranivsky, during which our discussion of this matter defined many features of our subsequent close collaboration. On Professor Muranivsky, see "Memories of Taras V. Muranivsky," *EIR*, July 27, 2001.

⁷³ Typical is the correlation between swings in policy-shaping within the Europe-U.S.A.-centered international economy during the course of the Nineteenth and early Twentieth centuries. For example, the explosive 1861–1876 unleashing of the U.S. potential as a leading world economic power, the spread of the U.S. 1861–76 model of policy-shaping during much of the 1877–1905 interval, with included swings, up and down, within the U.S.A. and elsewhere, during that interval. These swings are each and all caused by swings in political and financial-monetary policy, in ways which correspond to what might be appreciated as Kondratieff Waves during the span through the 1920s and beyond.

A related problem arises as a nagging disorder within the labor and socialist movements. The inventive operative, and the entrepreneur, locate their personal identity in discovering and employing qualitative improvements in physical principle and technologies. The labor bureaucrat, and the socialist bureaucrat, tend to be much more "intellectually conservative," one might prefer to say "backward," in these matters than the scientist, creative entrepreneur, or individual workman. Their tendency is to bureaucratize the economic process, to degrade the bureaucratic administration of those institutions to utopian schemes which resist important changes for the better, including technological ones.⁷⁴

In summary of that point, *under the kind of science-driver policy which I have outlined above, such effects would not occur.* I think that Academician Lvov, Dr. Glazyev, and other relevant professionals might go so far on this point, as to concur with my judgment, that if one acts in such a way as to appear to increase the density of overlapping "Kondratieff Waves" sufficiently, the prospect of "the end of a Kondratieff Wave" would never pose a threat.

The conceptual problem to be addressed on this account, is the following.

Economically illiterate opinion tends to think of the outcome of production as salable objects called products. In contrast to that, the science of physical economy emphasizes the role of the consumption of produced products as a medium through which fundamental scientific progress raises the level of the productive powers of labor, and of the physical and moral conditions of human life.

The issue of method posed by those phenomena of science-driven economic development, is as old as the notion of Heraclitus and Plato, that *nothing is constant, but change.* Economic science, as distinct from mere accounting, focuses upon the way in which the act of consumption contributes to a "relativistic" quality of up-shift in the anti-entropy of the physical economy as a process. That view of the matter may appear strange at first glance; but, if we consider an economic process from the vantage-point of a Riemannian physical geometry, the relevance of Plato's argument ceases to be strange. The relevant argument proceeds as follows.

⁷⁴ Notable is the popularized superstition in the labor movement, for example, that technology "steals jobs." No intelligent entrepreneur desires a society in which a reduced number of persons are productively employed. Only poor superstitious employers think of technology as reducing the labor-force, or similar goals. Intelligent entrepreneurs wish to expand the economy, and employment of the labor-force, and to upgrade the quality of the work-place and standard of living of the employed. It is the responsibility of government, to set rules in the economy which encourage investment and employment practices in the public interest, and to tend to employ economic policies which tend to send employers whose petty-minded opinions are injurious to the general welfare into more suitable occupations.

The essential form of action in an economic process, is the act of transforming the characteristic quality of action within the economic process itself, the increase of the anti-entropy of the process.

Take as an illustration of that point, a pedagogical argument I made during the 1950s, against the notion of "artificial intelligence" as presented by MIT's Marvin Minsky, *et al.* I drew out the implications of the argument of Minsky *et al.*, as follows.

If we were to assume that we could develop machines which could eliminate the requirement of the role of human labor in production, we would have to satisfy two general types of requirements. First, that the planet's economy were a single, functionally integrated such machine, which would automatically adjust to produce for all human needs under variable conditions of demand; second, that that integrated machine must cause itself to evolve in such a fashion, that it would do what a successful modern economy does: make and apply fundamental valid discoveries of universal physical principle to the effect of up-shifting the economic process in the manner a Riemannian physical geometry implies.⁷⁵

In that case, the primary functional characteristic of the action performed within that integrated machine, would not be the act of producing products, but of increasing the anti-entropy expressed by such a task-oriented process of self-development of the productive process itself. It would, of course, produce products; but, its ability to accomplish its mission on that account, would be, functionally, a by-product of its efficient *intention* to improve its capacity to produce improved products in a way consistent with the productive mission assigned to it. This is precisely what a well-conceived science-driver model of economy would do, without limit, into the indefinite future. This design would have a certain additional challenge built into it functionally, at least implicitly so. Its characteristic function would be the increasing of the rate of anti-entropy of this process of self-development. That is what the human species does when it is performing in a characteristically human way.

Look at the famous problem posed by Kondratieff from that vantage-point. The following point of illustration is a simplified one, but sufficient for the point immediately at hand.

Let someone assume, that a discovery in technology enables an economy to utilize some natural resource, and to improve upon that process up to a certain point. Then, the depletion of the relatively best-developed resources used, would force the economy to rely increasingly upon relatively marginal resources. The productivity of the economy would, presumably, decline, through attrition, until a new wave of technology-resources came into play. From my standpoint, as illustrated by the example I used in arguing against the delusions of

⁷⁵ Notably, such discoveries are systemically outlawed from the universe by the information theory of Professor Norbert Wiener *et al.*, as also by the doctrines of both "artificial intelligence" and "systems analysis" of John von Neumann, as by the Mephistopheles, Bertrand Russell, who tucked their lost souls in his vest pocket.

Minsky *et al.*, neither nature nor science as such has any part in creating such problems. Take the case of the great Mendeleev, as a rather obvious choice for a point of reference on the matter of Kondratieff Waves.

The achievement of Mendeleev's development of the periodic table, is, as my associate Jonathan Tennenbaum has emphasized for both that case and for Gauss's discovery of the orbit of the asteroid Ceres: not that he created it, but, rather, the method by which he discovered it. This method used by Mendeleev, whose success in that instance had far-reaching implications in many fields, led immediately to a series of successive new discoveries, including essential contributions to the matter of radioactivity.

Thus, the essential, functional significance of that discovery by Mendeleev, was clearly not an end-point, but, rather, an acceleration of the rate of fundamental scientific and related discovery. *In effect, discoverers such as Mendeleev create more resources, through the radiated impact of their achievements, than they cause us to tend to use up!*

This now brings me to a crucial point.

We must recognize, that the principal flaw in nearly all ways of thinking about accounting and economics today, is that these opinions and practices are, quite precisely, pathological reflections of the cultural legacy of civilization's murky oligarchical past. Even in the best days of the U.S. economy, even among virtually all employers and their trusted management staffs, the pathological conception of the employee prevailed: that of an object employed in producing an object. The idea that the essential product of human activity is, functionally speaking, humanity, did not occur to them; such ideas would be, and were brushed aside, usually with a frankly menacing, "business-like" show of irritation, as "impractical": *so go the glories of the world!*

Where the scientist sees human metabolism and the continued reproduction and development of the human species, the slave sees only "eating."

Typical of this impact of the oligarchical legacy, is the case of the toleration of the celebrated argument of the Physiocrat Dr. François Quesnay, by Karl Marx, and by many other victims of the influence of the British East India Company's Haileybury School in economics. Implicit *Bogomil* doctrinaire Quesnay's *laissez-faire* insisted that the profit of the estate is a "secretion" produced by the landlord's title of aristocracy, to the effect the role of the farmers is precisely analogous to that of the landlord's cows: human cattle. The contemporary doctrine of "free trade," "deregulation," and "globalization," are derived entirely from such *Bogomil*-modelled theological assumptions of John Locke, Quesnay, Mandeville, Giammaria Ortes, Adam Smith, Jeremy Bentham, Thomas Malthus, John Stuart Mill, Friedrich von Hayek, and so on.

This is the common pathological characteristic of all popular modern accounting and economic doctrine. To see this more clearly, one must look at mankind from a secure footing within the simultaneity of eternity. This means, to cease regarding oneself as an object consuming and producing mere sensory objects. It means to see oneself as acting on the past and future of mankind, for mankind. Once one's intention, as Kepler recognized the significance of *intention*, is to enhance the potential relative population-density of the human species, one's attention shifts from the mere thing-ness of the sensory object, to the importance of acting upon the process to transform the process itself. For the individual who has risen to a state of true adulthood, nothing exists but change; the object is to act to bring about needed change.

When one is dead, there would be time enough to reflect, if one could, upon the disgusting fact, that through one's own greediness, one never really achieved what it means to live. It is the function of leaders, to inspire people to act for their own sake and for the sake of mankind, to those happy ends which that sobering reflection should suggest.