
III. LaRouche on Scientific Principle

April 1, 1998

The Principles of Long-Range Forecasting

by Lyndon H. LaRouche, Jr.

During recent years, I have repeatedly defined a “New Bretton Woods” reform of international financial and monetary institutions. In a presentation to a March 18, 1998 seminar, held in Washington, D.C., I summarized that package of proposals once again, situating the package in the setting of the current series of global, financial, and monetary crises.¹ In this present report, the presentation of the hitherto almost unknown principles of long-range forecasting, is preceded by situating that topic, and its importance, within the relevant features of the presently ongoing, systemic breakdown of the world’s financial and monetary institutions.

During the 1992-1994 interval, the downward-bent, currently ongoing economic process, which has been engendered by nearly thirty years of increasingly bad policy-shaping, had entered its terminal boundary layer.² Since this 1992-1994 phase-shift in that process,

the plunge toward the already impending death of the present system, has been neither reversed, nor moderated, but, rather, significantly worsened, by every effort of governments and international financial authorities, to deny, or to avert the onrushing, general financial catastrophe.

The ‘Triple Curve,’ Again

The author’s familiar triple curve (**Figure 1**) identifies that 1966-1997 process which has led into the planet-wide, systemic financial and monetary crisis of October 1997-January 1998. The relevant features of that Figure are summarily described as follows.

A reversal of the direction of post-World War II policy-shaping, which began during 1964-1968, underlay the British sterling crisis of Autumn 1967, and the immediately ensuing U.S. dollar crises of the first quarter of 1968. In the U.S. case, policies motivated by “post-industrial utopian” ideologies, were initially introduced into actual U.S. government economic practice during 1966-1967, with an immediate, resulting decrease in the net rate of physical-economic growth in the U.S.A. By 1970-1971, the net growth of the U.S. economy, as measured in physical-economic terms, reached a net-zero balance, between increase of output and acceleration of attritional effects. With the introduction of the

1. A transcript of the March 18 address is published as Lyndon H. LaRouche, Jr., “Toward A New Bretton Woods,” *Executive Intelligence Review*, March 27, 1998. A “ninety-minute” video edition of the actual March 18 address has been published.

2. See, the author’s 1992 Democratic Presidential campaign address on the subject of “The Great Mudslide,” broadcast under the title, “The Man George Bush Fears the Most,” on the ABC-TV network, on Feb. 1, 1992. (Reported in Brian Lantz, “LaRouche on TV: Voters Listened to the Wrong People!,” *Executive Intelligence Review*, Feb. 14, 1992.) The quality of “boundary layer,” is typified by its characteristic, geometrically increasing turbulence, producing periodic shocks, all leading into a region of discontinuity. There are significant similarities to what Bernhard Riemann defines as the entry of a continuously accelerated projectile, within a tube of indefinite length, into the transsonic region [Bernhard Riemann, *Über die Fortpflanzung ebener Luftwellen von endlicher Schwingungsweite*, “On The Propagation of Plane Air Waves of Finite Magnitude,” *Bernhard Riemanns gesammelte mathematische Werke*, H. Weber, ed. (New York: Dover Publications reprint, 1953)]. At that latter

point, efforts to continue the system beyond that discontinuity, result in either an hyperinflationary, or hyperdeflationary chain-reaction mode of disintegration of the entire system. The 1921-1923, hyperinflationary efforts of Germany to meet the Versailles conditionalities, are an example of such a boundary layer. The present impact of both IMF and “Maastricht” conditionalities, is of the same species of folly as the 1921-1923 Germany hyperinflation.

FIGURE 1

A Typical Collapse Function

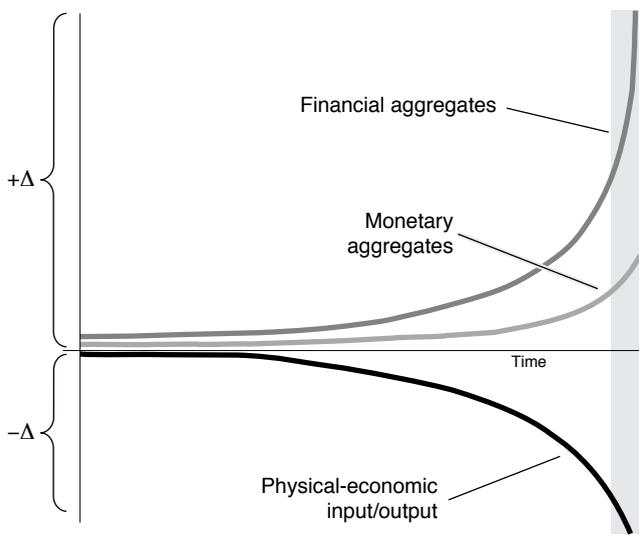
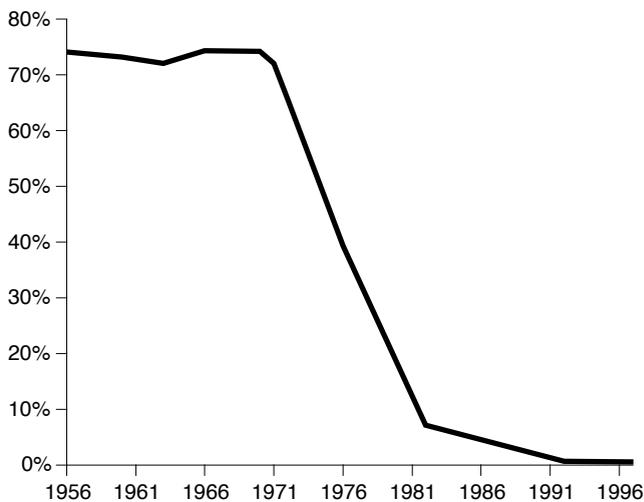


FIGURE 2

U.S. Import-Export Trade as Percentile of Foreign Exchange Turnover



“floating-exchange-rate” monetary system, in 1971-1972, the U.S. economy, *as measured in physical-economic terms*,³ has enjoyed a rate of annual contraction of more than 2% each year, to the present date.

Coinciding with that zero-balance which the U.S. economy reached in 1970-1971, the world’s financial and monetary system underwent a fundamental phase-change in its functional characteristics. This change is reflected most simply in the decline of the percentile of total foreign-exchange turnover attributable to combined imports and exports. In the U.S., for example (**Figure 2**), in the 1970s through 1990s to date, this disastrous change, to a “floating-exchange-rate monetary system,” was reflected in the new trend, world-wide, toward moving financial investment out of infrastructure, production, and trade, into pure financial and monetary speculation. In the new, post-August 1971, global regime, the greatest portion of financial investment moved into domains ever more remote from the real economy: Petrodollars, junk bonds, and derivatives.

Taking the 1966-1971 and 1972-1997 intervals as one, we have the “Triple Curve” presented in **Figure 1**. Beginning 1966, expansion of both monetary growth (e.g., M3) and financial aggregates, moves upward, in

terms of physical-economic measurements, relative to a decline in total investment (infrastructure, capital, labor, etc.) in real production and physical distribution of goods.⁴ It becomes increasingly clear, from 1967-1968 onwards, that continued net nominal (financial) growth, is obtained chiefly through expanding monetary aggregate, at the expense of looting of the total historical investment in the productive sectors. The increase of financial aggregates becomes increasingly dependent on nominal (fictitious) financial capital gains, the which, in turn, reflect, not production, but the increasingly complex relations between compounded appreciations which are based on nominal price-earnings ratios, and increase of monetary aggregates. Thus,

3. E.g., Lyndon H. LaRouche, Jr., *So, You Wish to Learn All About Economics?* 2nd ed. (Washington, D.C.: Executive Intelligence Review, 1996).

4. I.e., as measured in physical-economic terms. See LaRouche, *op. cit.* The Triple Curve is constructed as follows. First, the combined (household, production, infrastructure) market-basket, per capita of total available labor-force, of combined physical, education, science, and health costs, of present and prior intervals, are compared in physical, not monetary terms. The relative upward, or downward direction of per-capita changes in net physical output, is measured, first, in physical market-basket terms, not money-prices. The result of that comparison is plotted (i.e., the lowest among the three curves in the figure). In order to compare current physical output with monetary developments, the physical output is equated to current money prices of the per-capita market-basket constituents. Thus, the relationship between the lowest of the three curves and the scale of monetary turnover (e.g., M3) is measured. Finally, the price of the current volume of total financial aggregates outstanding is added: the top-most of the three curves.

the changes in curvature among the three depicted curves, are not statistical, but functional in nature. The function thus portrayed, is the “medical” chart showing that the patient is a dying, self-doomed system.

The combination of “bail-out” and increasingly savage, anti-human, austerity measures, imposed by governments and financial institutions, has had the net effect of being financially inflationary, in the sense of the similar 1921-1923 developments in Weimar Germany (**Figure 3**). The result of these putatively stop-gap efforts, has been to increase, rather than moderate, the intensity of the forces which underlie, and determine the outbreaks of successive storms of crisis on the surface. These measures have wasted large masses of the pre-existing, real capital assets, which were better expended in the economic-recovery efforts of a new system, to replace the presently doomed one.

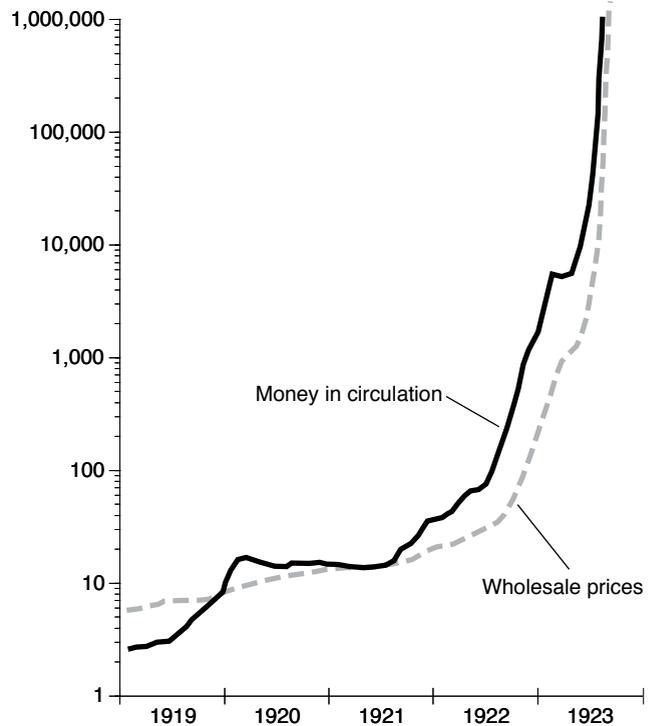
Typical are the net results of what were presumed to be those stop-gap measures adopted during the 1995 Halifax monetary conference. Those measures were intended to delay the plunge into what was, in fact, the then-already looming, financial-derivatives-driven end-phase of the system. The intent was to delay what was in fact the inevitable, to a time beyond the relevant 1996 elections.⁵ These measures postponed the onset of the next round of crisis on the surface; but, they also made the later crises, striking us during late 1997 and 1998, more rapid, and far more severe than would have been the case, had the necessary radical changes not been postponed, by the misguided decisions of the Halifax conference.

There is a relevant, most urgent political lesson to be learned from such heretofore typical, recent decades’ failures of leadership among the G-7 and other

5. From the period of the Halifax conference, see William Jones, “Clinton Puts Financial Reform on International Agenda,” *Executive Intelligence Review*, June 23, 1995. Jones wrote that the “reform” mechanisms specified in the Halifax communiqué “are useless to manage the global financial disintegration now under way—an impossible task.” Among recent discussions of the Halifax decisions, see U.S. Treasury Secretary Robert Rubin’s press briefing of Feb. 19, 1998, where he discussed a “new financial architecture”: “Even as we address today’s financial instability in Asia, the G-7 will also focus on efforts to reform the international financial architecture to better prevent crises in the future and to better manage them when they occur. We in the United States have been focussed on this for quite some time. As you may remember, the President took the leadership with respect to what became known as the Halifax initiatives. And more recently, over quite some number of months now, the Federal Reserve Board and Treasury have been working together on this question of architecture.” The issue is discussed in Michael Liebig, “Biggest Bailout in History Still Won’t Save World Economy,” *Executive Intelligence Review*, Jan. 23, 1998.

FIGURE 3
Germany and Hyperinflation, 1921-23

(index 1913 = 1)



Source: Knut Borchardt, “Wachstum und Wechsellagen 1914-1970,” in Hermann Aubin and Wolfgang Zorn (eds.), *Handbuch der deutschen Wirtschafts- und Sozialgeschichte*, Stuttgart: Klett, 1976, vol. 2, p. 699.

governments. That failure of the Halifax meeting, while typical of the intellectual mediocrity pervasive among the recent crop of heads of government and leading political parties, must also remind historians of the folly of Germany’s “young Moltke,” who, in 1914, fled from the risk of obtaining an early and pre-assured military victory, by dissipating the concentration of resources essential to victory, into a fool’s errand, dispersing that concentration to levels below the critical level needed for the right-flank assault, for the silly purpose of seeking to minimize, needlessly, a wide assortment of relatively irrelevant varieties of risks.⁶ Such behavior in the political command of today’s nations, should remind us, fondly, of “Organizer of Victory” Lazare Carnot’s successful replacement of such defective kinds of general officers by, in some

6. On “young Moltke’s” folly, see Andreas Ranke, “Schlieffen, Carnot, and the Theory of the Flank,” *Executive Intelligence Review*, Feb. 6, 1998.

notable instances, selected, more effective sergeants.⁷

The performance by the consensus among leaders at Halifax, would be described most charitably, by comparing it to a group of unemployed actors engaged in theatrical try-outs, competing for the role of Shakespeare's self-doomed Hamlet. Such is the shilly-shallying pragmatism of fearful political leaders, controlled by their desperate attempts to deny the fact, that the present world economy, like that of the U.S.A. and western Europe, in particular, has already collapsed far below the quality of thirty years ago, with doom not far ahead.

In fairness to the individual leaders who participated in that wretched consensus, in their capacity as individual personalities: that pathetic behavior of the group as a whole, reflects the qualities of performance sought in the selection of today's leaders. That defective mode of performance, is what selected leaders are strongly advised to adopt. See the image of Rembrandt's "Belshazzar's Feast"—such behavior of societies and their leaders, is characteristic of the self-doomed, presently existing political system of today's nations, and of the institutions of today's "global community." Such folly as exhibited at Halifax, is not the result of any randomly determined coincidence of bad leadership by particular officials. The folly represents nothing less than what is demanded of today's national leaders by the self-doomed, present political system at large. In any case, such cowardly zeal to deny the fearful evidence, is today's potentially fatal, tragic flaw, the leading source of danger to global civilization.⁸

7. In 1792, Carnot was elected to the Legislative Assembly; after the Reign of Terror began in 1793, he was named to the Committee of Public Safety. He took all military operations under his control, for France's war against Austria, Prussia, and Britain. In 1793-1794, he formed a new, mass-based army; organized the military forces for total war; and concentrated his military efforts on attacking the English. See Dino de Paoli, "Lazare Carnot's Grand Strategy for Political Victory," *Executive Intelligence Review*, Sept. 20, 1996.

8. This type of denial is not an accidental, but, rather, a characteristic pathology of the "Baby Boomer" generation's heritage of university campus-based, mid-1960s youth counterculture. This pathology, concentrated within the influential university-student strata of the generations born after August 1939, has produced a radical form of cultural relativism, typified by the "Rainbow Coalition" phenomena, known as "politically correct" language and related codes of behavior. The essential characteristic of this cultural relativism, has infected the "New Age" strata within two succeeding generations. Notably, today's "political correctness" is copied, intact, from Nazi Propaganda Minister Josef Goebbels' *Gleichschaltung*, and also from the Communist parties of the U.S.A., and elsewhere, during the 1920s through 1960s. Spawned within such "Orwellian" regimes, this perversion now marches under the banner of the U.S. National Endowment for Democracy and kindred trade-styles. It is also characteristic of the code of "political correct-

ness" specific to the neo-conservative yahoos of Speaker Newt Gingrich's following, and to the kindred neo-fascist currents, within the labor movement and elsewhere, of the present-day Lovestoneite tradition of the Communist International's so-called Right Opposition. Another, related, leading source of this type of "political correctness" in speech and related codes, has been the so-called "Frankfurt School," established for the explicitly adopted purpose of carrying out nihilist and Freudian-Marxist Georg Lukacs' corrosive program for destroying western European civilization from within. The essential characteristic of all varieties of political correctness, the programmatic outlook of the Rainbow Coalition included, is compulsively exegetical modes of sophistry, or, in short, lying with a fraudulent explanation. By this ruse, a calamitous, thirty-year decline in the U.S. real standard of living, is called progress; the exegetical fraud behind this outright lie (that the economy is fundamentally sound), is the sophistry, that, since the downward changes in real standard of living are correlatives of progress toward the paradise of "post-industrial society," we must judge today's conditions by "post-industrial," not real-life standards of performance. Such pathological behavior, in the service of "political correctness," should be recognized as an outgrowth of that dogma of cultural relativism, which denies the existence of those universal truths, upon which the U.S. Declaration of Independence and Federal Constitution were absolutely premised.

9. This schematic was introduced in the author's address to a conference of the International Caucus of Labor Committees and Schiller Institute in Eltville, Germany, on Dec. 2, 1995, and was published in *Executive Intelligence Review*, Jan. 1, 1996. See also the Presidential-candidate's address on Martin Luther King Day, published in *Executive Intelligence Review*, Feb. 2, 1996. For a more recent discussion of the elements of the figure and their interaction, see the author's speech to the ICLC-Schiller Institute conference in Arlington, Virginia, on Jan. 17, published in *Executive Intelligence Review*, Jan. 30, 1998.

Beyond the 'Ides of March'

10. Lyndon H. LaRouche, Jr., "What Economics Must Measure," *Executive Intelligence Review*, Nov. 28, 1997.

My definitions of the "Triple Curve" function, show the relevant internal dynamics of the present financial-monetary system: From this boundary layer, now, and already then, in 1995, the present global financial and monetary system, as it has evolved since 1967-1971, could never emerge alive from the passing of this century.⁹

With the onset of the forecasted, October 1997 outbreak, of a new phase of this systemic crisis of the international financial system as a whole, global financial conditions had become wildly turbulent. This evidence of qualitatively increased density, and global scope of turbulence, should be recognized as a reflection of the financial process's extreme nearness to the outer limits for continued existence of the entire, global system.¹⁰

round of crises for the second quarter of 1998, a crisis far more turbulent, more intense, with wider, chain-reaction impact, globally, than that which had erupted during late October 1997.

It is more than merely conceivable, that this new round of turbulence could detonate that chain-reaction collapse of the derivatives bubble, which would not only disintegrate virtually every central banking system of the planet, but produce that effect within as brief an interval as several panic-stricken days. A more cautious estimate would be, that this will be the penultimate shock, prior to the next round, when refusal to adopt the author's policies, would make virtually certain, that the world's economic system would plunge, like Mozart's guilty Don Giovanni, into the impatiently waiting abyss.

Acknowledge this to be the situation. Then, suppose, that the majority of today's shapers of economic policy, otherwise recognized as the political establishments' "free trade" and "globalization" fanatics, aided by the "young Moltkes" of 1998, were to succeed in preventing the early adoption of the kind of "New Bretton Woods" agenda which this writer has specified. In that case, the presently erupting, new, April-June resurgence of this crisis, will accelerate the present, terminal phase of the world's systemic, financial and monetary turbulence, thus bringing the world to, if not over the edge of a waiting abyss. That abyss is the imminent threat of a collapse of civilization into a "New Dark Age," similar to the Fourteenth Century "New Dark Age," but, this time, on a planetary scale.

Thus, during the second quarter of 1998, the world is, once again, experiencing an attempt, led by wild-eyed monetarists of the Mont Pelerin Society type, to meet yet another round of global financial-monetary crisis. Their Pavlovian response to each crisis, continues to be a combination of sundry hyperinflationary financial-monetary measures, with predatory extremes of austerity, and other tactics for "bailing-out" private financial institutions. A likely, new repetition of such habituated, morbid lunacy, if it were not prevented, would appear in the form of a maddened horde of political flagellants' stubborn repetition of the disastrously failed tactics, employed in response to the earlier, year-end "Asia crisis." The fabled, failed, doomed King Canute could not have been more pathetically tragic.

For a brief time, if only in the opinion of very gullible persons, such wildly desperate, blind-ideology-driven measures, like the doomed, hyperinflationary

stock-exchange bubbles of February-March 1998, might succeed, like the eye of a hurricane, in moderating the surface turbulence of the present, April-June round of the crisis. Then, during that brief interval of relative calm, the world's great fools would agree to say, as they had done repeatedly earlier: "Let us pretend that the storm has passed. Let us pretend, that our system as a whole is 'basically sound.'"

In reality, contrary to such childishly hysterical huddling of leaders in their mental fox-holes, this time, their actions themselves would push the global system to, or even over the edge of a virtually "thermonuclear" form of debacle, either as a Weimar Germany-type of hyperinflationary disintegration of the system, or reversed financial-leverage implosion of the world's \$140 trillions-plus financial bubble. Without the measures of reform I have proposed, the implosion of that bubble would plunge the world into a Fourteenth-Century-style "New Dark Age," this time on a planetary scale.

To repeat the crucial point presented in the March 18 address: If the world is to avoid such an impending, general collapse into a "New Dark Age," a leading group of sovereign nation-states, which might be otherwise known as "We, the Survivors," must act to initiate a sudden, and radical turn, even over the objections of any number among other nations: to adopt arrangements, best compared for similarities with the Bretton Woods rules of the 1950s period of post-war economic reconstruction. Without the virtually immediate adoption of those changes, in rules of monetary exchange, international finance, and trade, which I have therefore identified as the needed, "New Bretton Woods" measures, it is assured that the world would be plunged, very soon, into a planetary "New Dark Age."

As emphasized in that address: The sudden and radical, proposed measures of financial and monetary reform, are indispensable, but not sufficient by themselves.

The world requires a design for a new, stable, global financial and monetary order. The purpose of this, is to create the pre-conditions under which an immediate trend of physical-economic recovery is possible. Without such radical changes in the financial and monetary system, no physical recovery of the world's economy could be expected earlier than the middle of the Twenty-First Century.

That mid-Twenty-First-Century recovery, if it were to occur, would be preceded by an intervening period

of, perhaps, two generations, a terrible period of deep demographic collapse through factors of famine and disease. The monstrous developments in Russia, since the end of 1991, including a stunningly precipitous demographic collapse, are a foretaste of the horrible fate which will grip all nations of this planet, should the indicated “New Bretton Woods” not be installed during the weeks and months immediately ahead. The rapid collapse of our planet’s population, to the levels of no more than several hundred millions, is a plausible scenario under such conditions.¹¹

To prevent this catastrophe, the indicated changes in financial and monetary rules are indispensable.

Although those specifications for new financial and monetary rules are indispensable, I do not suggest that such necessary changes, by themselves, will cure our problem. Like the great reconstruction of the 1946-1966 period, under old Bretton Woods rules, a good financial and monetary system itself, could not create a recovery spontaneously. Such a system does little more than create the pre-conditions under which it is possible to launch a sustainable form of economic recovery. The Bretton Woods conditions of the 1950s, did not cause the post-war economic recovery in Europe. The Bretton Woods rules of Harry Dexter White, et al., helped by the marginally crucial role played by the modest flow of Marshall Plan funds, contributed the conditions without which the economic-recovery programs of sovereign governments could not have succeeded as they did.¹²

11. The case to study, for comparison, is what is termed Europe’s collapse into a “New Dark Age” of the mid-Fourteenth Century. This was the result of approximately a hundred years of devolution of European civilization, following the death of the Holy Roman Empire’s Frederick II, a degeneration of Europe, under Guelph League hegemony, which culminated in the inevitable collapse of the Europe-wide Lombard banking system of the mid-Fourteenth Century. During this period, approximately half the pre-existing parishes of Europe were wiped from the political map; during the terminal phase of this century-long moral, political, and economic degeneration of Europe, the population collapsed by no less than one-third. The repetition of such a terminal collapse of the present world financial and monetary system, would quickly reduce the “carrying capacity” of this planet, from over five billions, at present levels of practiced technology, to no better than a world population of several hundred millions, and that within a period of not more than approximately two generations. The world is not threatened by an “Armageddon,” but, rather, something between the import of “Belshazzar’s Feast” and the doom of Biblical Sodom and Gomorrah: the end of a culture which had willfully abandoned its moral fitness to survive.

12. Predominantly, the reform adopted at the war-time conference, held in Bretton Woods, New Hampshire’s Mount Washington Hotel, was the product of the influence, reflected in President Franklin Roosevelt, of a

So, the new rules, which my associates and I have presented for immediate adoption, are designed specifically to create the preconditions favorable for what is fairly described as a global, Franklin Roosevelt-style economic recovery.¹³ The object of the design, is the fostering of large-scale, productive capital formation, permitting the successful use of new sources of credit, mobilized for this purpose by sovereign governments.

The world requires accelerating rates of new, real capital formation in agriculture and industry, with emphasis upon high rates of technological progress. However, such economic renewal would not be possible without the inclusion of a massive infrastructure-build-

group of U.S. historians and economists reflecting the tradition of Benjamin Franklin, Alexander Hamilton, Mathew Carey, Friedrich List, and Henry C. Carey. (See *Political Economy* feature, in *Executive Intelligence Review*, March 20, 1998.) While President Roosevelt lived, the new, post-war, international monetary system was intended to function as an integral part of Roosevelt’s patriotic determination to eliminate all colonialism, and also the dominant influence of British economic liberalism, at the close of the war. With the death of Roosevelt, and the role of Stimson and others in inducing Harry Truman to order the effectively worse-than-useless nuclear bombing of Hiroshima and Nagasaki, the British and their co-thinkers were able to prevent Roosevelt’s post-war “American Century” reforms, from being carried through as intended. The role of Harry Dexter White, as contrasted with the contrary influences of John Maynard Keynes, should be noted; these differences dominated the often contradictory tendencies within the post-Roosevelt functioning, 1946-1971, of that monetary system. Although Germany received a much smaller ration of Marshall Plan aid, per capita, than Britain or France, Germany’s performance was vastly superior to either of those neighbors. The reason for Germany’s superior financial performance over its neighbors, is centered in the U.S. government’s acceptance of banker Hermann Abs’ proposal for establishing a Franklin-Roosevelt-style institution, Germany’s *Kreditanstalt für Wiederaufbau*. Additionally, however, it should be noted that the superiority of Germany’s economy, over those of Britain and France, since 1876-77, is Germany’s use of its world-leadership in science, then, as a driver for its copy of that 1861-1876 model of the American System of machine-tool-design-driven agro-industrial progress which had been launched, under U.S. President Abraham Lincoln, by the world’s then leading economist, Henry C. Carey. As a result of the combination of this American model and the measures associated with the *Kreditanstalt für Wiederaufbau*, Germany did not tolerate the kind of waste of its Marshall Plan funds, which caused the inferior performance of Britain and France.

13. The emphasis here, is Roosevelt’s intended post-war measures: to end, immediately, all colonial systems; to terminate the domination of the world market by the British “Eighteenth-Century methods” of “liberal economics;” and, to make available to the liberated former colonies, as to the nations of Central and South America, the opportunity to participate in the economic methods and technologies of progress enjoyed by the United States itself. In short, what we supporters of the Non-Aligned Nations’ effort, were pleased to identify as a “just new world economic order.”

ing program, planet-wide. Without that latter program, global economic recovery of per-capita physical output would not be sustainable, and, in many regions of the world, could not even begin. Nor would such an infrastructure-building program be possible, without the proposed “New Bretton Woods” financial and monetary reform, reversing supranational authorities’ hitherto persisting nullification of those preconditions for freedom and democracy, which can be sustained only under the rule of technologically progressive, perfectly sovereign nation-state republics.

The world must be transformed immediately into a system of partnership among sovereign nation-states, as American System advocate Friedrich List laid the foundations for the modern European national economy, or, as President Charles de Gaulle envisaged such partnership among the perfectly sovereign nation-states, “from the Atlantic to the Urals.”¹⁴ Without that change, the needed high rates of physical-capital formation, could not be achieved and sustained. Without the proposed monetary reforms, re-establishing the sovereignty of nation-state republics, a viable economic recovery could not be organized.

The Lesson of Versailles

So, in its leading features, the presently needed “New Bretton Woods” must be viewed as a set of rules designed not to provide, but to foster a kind of general economic reconstruction. This is an economic reconstruction similar to that which lifted Europe and other parts of the world out of the ruinous conditions imposed upon national economies by the Versailles Treaty, and by the ensuing depression and World War II.

It should be stressed that the processes, including the rise of Adolf Hitler in Germany, leading into World War II, would not have been possible without the persistence of a global environment created by those same “Economic Consequences of the Peace” which were

14. The “Europe from the Atlantic to the Urals,” envisaged by President de Gaulle, has no congruence with the return to the political institutions of Europe’s Middle Ages and the 1818-1848 “Thirty Years War:” the Maastricht agreements imposed upon continental Europe by such foaming-at-the-mouth, rabid German-haters as Britain’s Prime Minister Margaret Thatcher and de Gaulle-hating French Socialist President François Mitterrand. These were the same pair which launched the post-1991 Balkans War, which like the Entente Cordiale’s launching of the pre-World War I Balkan Wars, had the purpose of drawing Russia, Austria, and Germany into a war of mutual destruction, by aid of which Britain, assisted by its French poodles, might exert virtual supremacy over continental Europe.

the principal, forecasted results of Versailles.¹⁵ We must look back to the lessons to be learned from studying both of the conditions which the Versailles system generated: the systemic crisis of 1920s Germany, and the cyclical depression of the 1930s. With the effects of that depression, and its ensuing war, in view, we must focus upon the initial period of reconstruction in progress throughout the 1946-1957 interval. We must apply those successful precedents, not as patented, or otherwise perfect models;¹⁶ the crises of the 1920s and 1930s were predominantly expressions of a global cyclical crisis, whereas the present crisis is a global systemic one.¹⁷ With that crucial distinction in mind, we must study the 1946-1957 period of post-war reconstruction, as a source of insight into some of the similar, if more challenging, features of the present case.

Then, at the close of World War II, the task of financial and monetary reform, was undoing the evils of Versailles. The “new Versailles,” today, is those prevailing policy-shaping trends of the recent thirty-odd years, which have now plunged us into this presently ongoing, global, systemic, economic-breakdown crisis. The Bretton Woods rules of the 1950s, provide us many ap-

15. John Maynard Keynes, *The Economic Consequences of the Peace* (New York: Harcourt, Brace and Howe, 1920). The circumstances for Adolf Hitler’s Autumn 1923 rise from obscurity, and later, London and Harriman family-backed rise to power, in 1933, were, like the moral degeneracy of 1918-1943 France, made possible by the conditions imposed upon Europe by Versailles. However, that does not mean that Versailles made Hitler’s rise to power inevitable. What made Hitler, and World War II “inevitable,” was the repeatedly successful intervention of, chiefly, London and New York bankers, to crush all those forces, like the German patriot, Dr. Wilhelm Lautenbach, whose anti-Versailles programs of economic reconstruction, could have made Hitler’s London-backed rise to power impossible. Just so today; if the cabal of powerful lunatics, centered around London’s financier oligarchy and Robert Bartley’s *Wall Street Journal*, succeeds in defeating those who work to overturn the present globalist system, then the worst result is inevitable. Who were then to blame for the result? The incurably evil financier-oligarchs and their lackeys—or the cowardly, corrupted ordinary citizen, who declines to support those, upon whom the future life of the citizens’ children, grand-children, and great-grandchildren may depend absolutely?

16. E.g., the folly of the Eisenhower administration, from 1954 on, in following the advice of Arthur Burns, thus setting into motion the financial bubble expressed as that deep, 1957-1960 recession, which erupted in February 1957.

17. On the distinction between the past cyclical (e.g., “business cycle”) crises, and the present, planet-wide, systemic crisis, see Lyndon H. LaRouche, Jr., “What Economics Must Measure,” op. cit., and, also, the concluding section, subtitled “The Business Cycle,” of Lyndon H. LaRouche, Jr., “Russia Is Eurasia’s Keystone Economy,” *Executive Intelligence Review*, March 27, 1998, pp. 51-52.

plicable precedents for those radical reforms essential for lifting the world's economy out of the different quality of systemic nightmare, created by that "new Versailles," the which is the recent thirty years' trends in policy-shaping.¹⁸

The 'New Bretton Woods'

To this effect: compare the results of two monetary systems: a) the old Bretton Woods agreements, up to the point of the U.S. manned landing on the Moon; and, b) the results of changes in policy-shaping, hegemonic since 1971-1972. Compare these systems in terms of directions and rates of change in physical-economic output, as measured per-capita and per-square-kilometer of relevant surface-area of our planet (**Figure 4**). There is no doubt that, by comparison of performance, the outcome of the post-1972 period of a "floating-exchange-rate" system, has been worse than a great error; it is a disaster. As we have stressed, once again, here, there are significant qualities of difference between the conditions of the 1950s and today; nonetheless, there are but a few important differences of detail, between the old Bretton Woods, and the form in which its useful moral and juridical precedents should be revived now.¹⁹ Otherwise, the principles of successful reconstruction itself remain, if only broadly, the same as those which led into the fabled "economic miracle" achieved under

18. The 1950s of Italy's Alcide de Gaspari, Germany's Konrad Adenauer, and, at the close, Charles de Gaulle, represents the "take-off" period of European post-war reconstruction. These were the years of relatively tight exchange controls, and related protectionist measures by sovereign nation-states, restrictions which were essential to establishing the foundations for the achievements of the pre-1971 1960s. Thus, the way in which the Bretton Woods system functioned during the 1950s period of relatively tight, dirigistic forms of financial and monetary restrictions, is the phase of the old Bretton Woods system most usefully referenced in addressing the increasing disorderly, tumultuous present circumstances and their inevitable near-term aftermath.

19. The principal difference required, is the replacement of the past role of central banking systems, by "Hamiltonian" national banking. Given the ratio of current obligations to current GDP, virtually all of the world's central banking systems are already hopelessly bankrupt. While we can ensure the continued functioning of all the socially necessary private banks through government-supervised bankruptcy-reorganization, the central banking systems themselves are no longer capable of generating adequate supplies of credit. They could not even maintain the present levels of employment, production, and trade. New credit must be generated by the power of sovereign governments, a measure balanced by writing off in excess of \$140 trillions equivalent, globally, of derivatives and other largely fictitious financial assets, and by rewriting much short-term and medium-term legitimate debt, as long-term debt at yields in the order of 1% to 2% annually.

Germany's Chancellor Konrad Adenauer.

All these considerations, when combined, require a radical change, not only in financial and monetary policies, but also a profound change, away from the recent decades' thinking about economics, the which latter has become hegemonic among virtually all among the world's governments and financial institutions.

To that end, it is the included purpose of the present report, to show, that had the latter institutions employed a competent notion of long-range economic forecasting, at any time during those changes of the recent thirty-odd years which have ruined us, rational governments would not have tolerated those policies, which have now brought this world to its present brink of a planetary "New Dark Age" abyss. We would not have tolerated the kind of thinking which became hegemonic during the recent thirty-odd years.

From the vantage-point defined within this report, there is no mysterious cause for the world's present dismay. The bad policies which have ruined the world's economy, were choices made under the influence of that generally accepted, but increasingly defective, so-

The Failure of Post-1971 Economic Policymaking

The charts in **Figure 4** show three series, for comparison.

In Series 1 (Figures 4.1.1-4.1.6) you see the cancerous growth-rate of financial turnover in the United States, in the period 1971-1973 to the present. Indicative sub-categories of turnover are shown, of money flows into mergers and acquisitions, money flows into futures speculation on interest rates, on currencies and equity indices, and so forth. Overall in the United States, valuations of stocks, debts, and especially, since the mid-1980s, derivatives, have grown at hyperbolic rates. Worldwide speculation in derivatives shows the same cancerous growth rate.

Series 2 (Figures 4.2.1-4.2.5) shows the decline in money flows into investments into basic production sectors of all kinds in the U.S. economy, over the same time period that, in contrast, financial speculative

Continued on next page

FIGURE 4.1.1

U.S. Merchandise Trade as Percent of Global Dollar Currency Trading

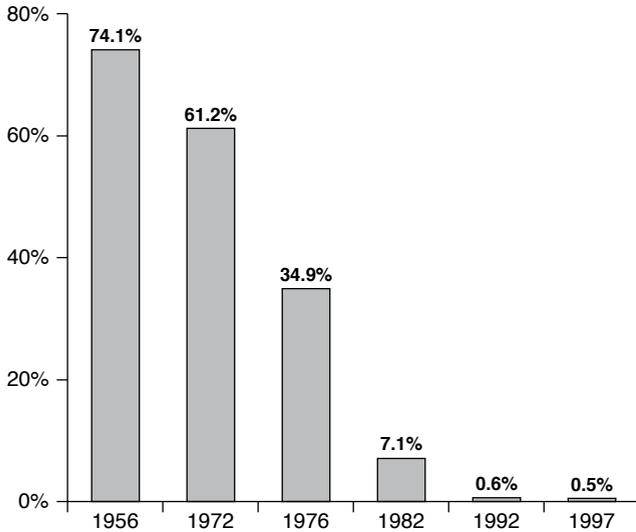
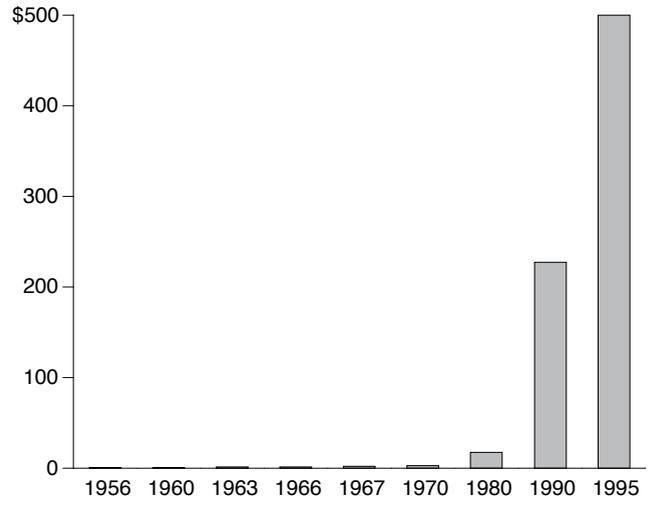


FIGURE 4.1.2

Annual U.S. Financial Turnover

(trillions \$)



called “mainstream” opinion, which has dominated, increasingly, the selective shaping of policies of government and relevant private institutions, during most of the recent thirty-odd years. Had rational governments foreseen the outcome of such “mainstream opinion,”

they would have acted to resist such opinion, and also uproot it by aid of the most vigorous re-education of an economics-illiterate, duped general public.

For related reasons, without the added adoption of that needed standard of long-range forecasting now, as a guide to, and integral feature of future policy-shaping,

Continued from previous page

turnover ballooned. Also shown, is the related decline in proportion of the U.S. workforce engaged in essential activity in these sectors. The percentage of workers (as a share of all operatives), and the percentage of investment (as a percent of the Gross Domestic Product) have declined over the period from 1971-1973 to the present, for manufacturing, agriculture, basic physical infrastructure (water, power, transportation, etc.), construction, and related categories of activity. This does not reflect increased productivity; just the opposite. The declining productive investment and employment show up as declining rates of production and consumption levels per household in recent decades. The final graph of this series, illustrates one aspect of this devolution of the economy, in terms of the deteriorating condition of an average household. In the 1960s, the pay-check of the principal wage-earner, would cover the four basics shown (home, car,

food, health care), with money remaining for other essentials; at the same time, households were productively engaged in the economy. Today, households can no longer exist on the pay-check of the principal wage-earner—typified by the recourse of family members to hold, among them, several jobs per household. At the same time, the numbers of jobs in non-productive activities in the economy have proliferated—typified by casino employment, part-time fast-food jobs, and all kinds of non-essential services.

In Series 3 (Figures 4.3.1-4.3.4), you see the deteriorating composition of U.S. national product, in terms of even such a crude measure as Gross Domestic Product. It is obvious how the value is dropping in the period 1971-1973 to the present, of the component of GDP related to manufacturing and goods production, relative to the rise in value of financial, insurance, real estate, and related non-productive services.—*Marcia Merry Baker*

FIGURE 4.1.3

Hyperbolic Growth of the U.S. Financial Aggregate

(trillions \$)

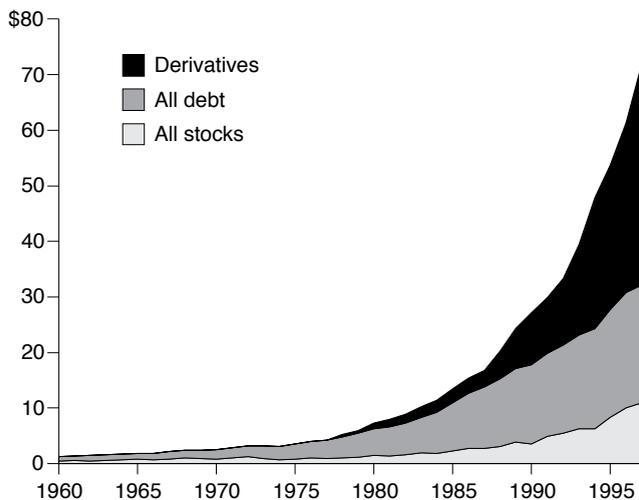
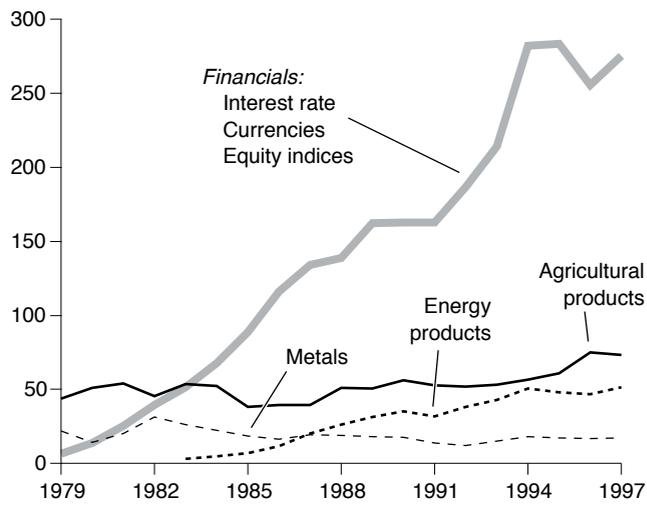


FIGURE 4.1.4

Financials Dominate Futures Markets

(millions of contracts traded)



the possibility of successfully managing the needed recovery would be jeopardized.

Never again, must we allow governments to do as the failed, neo-liberal architects of the floating exchange-rate system did. Never again, must we allow the kind of ranting, romantic ideologue's compelling emotional impulses, mere prejudices, to override discretion in choosing a route of travel in economic development. Never again, must we permit ranting ideologues, like the flagellant hordes of the Fourteenth Century, or today's wild-eyed Heritage Foundation fanatics, to menace the public welfare, or permit our economies to be directed by deranged ideologues, to an H.G. Wells', or related style of proposed sociological utopia.

Instead of demanding "politically correct" conformity with today's prevalent madness, with prevailing blind faith in popularized ideological fads and their virtual-reality agendas, check the actual route of travel implied, beforehand. Hereafter, nations must check carefully, in advance, the character of terrain through which the proposed route of travel actually leads.

This brings us directly to the core subject-matter of this report.

Up to this time, no government of the recent quarter-century, or other relevant leading institution of the same period, has yet become sufficiently competent to define adequately the policies needed, in the aftermath of the adoption of a New Bretton Woods mone-

tary order. Although the appropriate methods of long-range forecasting remained chiefly in obscurity, even among otherwise competent economists of an earlier, happier period, even those qualified competencies have chiefly vanished from leading "mainstream" policy-shaping opinion today. Three decades of impact of a declining culture, globally,²⁰ have produced the state of affairs, in which, with few exceptions, even among the relatively best relevant professionals, most lack competence, in the specific degree

20. Franklin Roosevelt had the advantage of counsel provided by a patriotic tradition among historians and economists. This "American System" tradition of Franklin, Hamilton, the Careys, John Quincy Adams, Henry Clay, Friedrich List, and Abraham Lincoln, persisted, even after the unfortunate U.S. Presidencies of Teddy Roosevelt, Ku Klux Klanner Woodrow Wilson, and Calvin Coolidge, as a strong, if minority current in U.S. academic and related life, until the unfortunate developments, which followed the historically most untimely death of Franklin Roosevelt. It was systematically purged from the textbooks and the universities, by the burgeoning influence of the neo-Jacobin rabble of epistemologically cretinous Frankfurt-Schoolers and intellectually kindred leftists and neo-conservatives, during the middle to late 1960s, and beyond. Hence, few professionals of the 'Sixty-Eighter generation of university graduates, have any competence at all in matters of political-economy and actual history. President Clinton, who suffers conspicuous short-comings of this sort, is otherwise a relatively superior intellect, among the representatives of his own and the succeeding generations of professionals. On more general implications of the cultural decline of European civilization during the Twentieth Century: that is a sub-topic is better treated in the relevant location of this report, below.

FIGURE 4.1.5

Mergers and Acquisitions versus Manufacturing New Plant and Equipment

(billions \$)

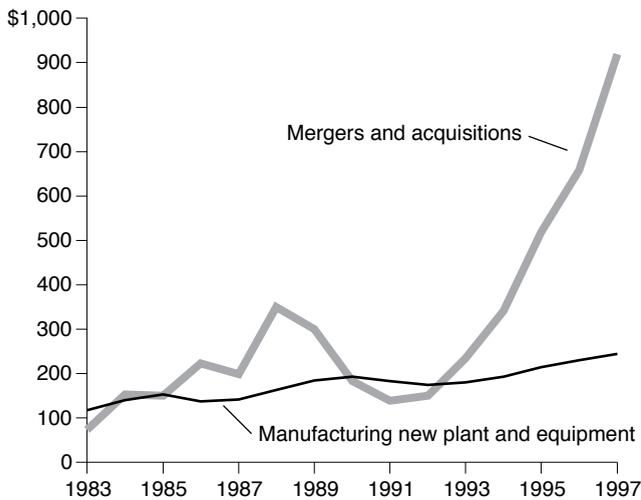
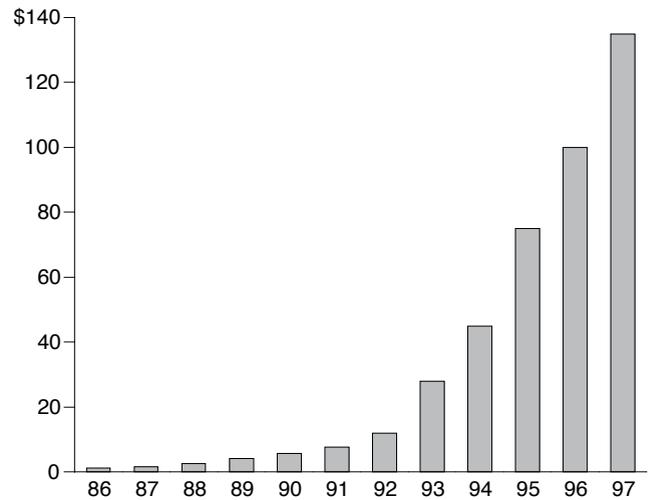


FIGURE 4.1.6

World Derivatives Growth: The Cancer Takes Over

(trillions \$)



the present circumstances of crisis require competence.

In these matters, a relative few among professionals contribute useful suggestions; worse, so far, even those professionals are not likely to discover adequately appropriate answers, until they have, first, corrected their habitual thinking, in the degree wanted for identifying the relevant questions. Earlier, I have identified and summarized the essential features of that matter, of long-range forecasting. We continue that discussion here, extending it to its bearing on both the design and management of a physical-economic recovery program.²¹

The Task of Forecasting Defined

In any rational use of that term in today’s economics practice, “long-range forecasting” signifies the selection of choices of any present day’s policies, according to the foreseeable consequence of one’s choice not less than seven or more years ahead, usually one to two generations ahead. Usually, as in respect to the 1964-1972 roots of the presently worsening global economic disaster, it has been changes in axiomatic features of cul-

21. See the discussion of this matter, under the sub-heading of “Marx’s blunder on technology,” in Lyndon H. LaRouche, Jr., “Russia Is Eurasia’s Keystone Economy,” *Executive Intelligence Review*, March 27, 1998, pp. 47-51. Since this involves conceptions and principles unknown to most professional economists, and relevant others, it is necessary to include here a restatement of the argument made earlier, in those pages.

tural outlook, from one generation to the next, which are of the relatively greatest significance, in directing the effects of policy-shaping along either an upward, or a downward track in effects.²²

Within the relatively narrow framework of the relative best among those doctrines of recent decades’ industrial and agricultural practice, the which are to be found under the rubric “economics,” three interacting factors of cost, determine the minimum duration (“horizon”) such forecasts must span. These three are: 1) Capital-intensity, and correlated energy-density, of investments in infrastructure, agriculture, and industry; 2) Simple physical depletion, through wear-and-tear, of capital improvements; 3) Relevant rates of technological attrition. The following, unavoidable costs of profit-

22. In general, it is during childhood and adolescence, that the axiomatic assumptions of the coming new adult generation are instilled. Most crucial, is the portion of each generation which is destined to dominate, through promotion, the policy-shaping strata of leading private and governmental institutions, a generation to a generation-and-a-half later. It is not necessarily the case, for all time, that the capacity for original, axiomatic discoveries should tend to evaporate beginning about twenty-five years of age [Cf. Lawrence S. Kubie, “The Fostering of Scientific Creativity,” *Daedalus*, Spring 1962]; nor, need the exceptions be limited to the relatively tiny, and still shrinking number of true thinkers among today’s matured professionals. However, whatever the brighter prospect for the future, the tendency for creative sterility among matured professionals has been the dominant trait of modern populations until this point.

FIGURE 4.2.1

Manufacturing Investment and Employment

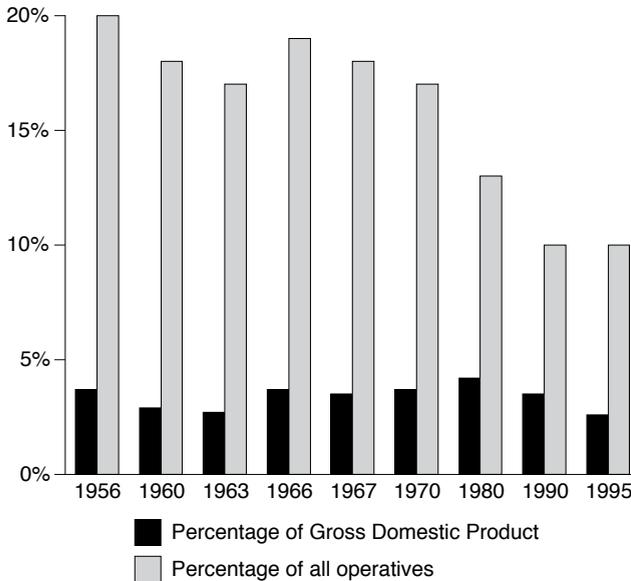
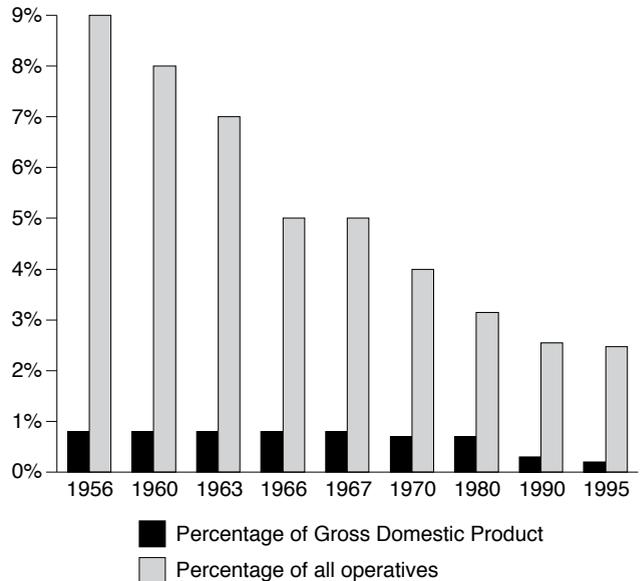


FIGURE 4.2.2

Agriculture Investment and Employment



ability, are thus derived: 1) What are the rates at which maintenance of existing capital stocks must be provided?; 2) What are the minimally required rates of replacement?; and, 3) What is the required, combined rate of technological progress and energy-density, per-capita of labor-force? Otherwise, in general, what, in broader terms, do these specified requirements also imply?

To lay the basis for the answer to those questions, I must proceed now, first, by repeating, in summary, several points which have been characteristic of my work in, and teaching of economics²³ during the recent forty-

five years, since the outcome of a study conducted during the 1948-1952 interval.²⁴ During all of that time, from 1951-1952 to the present, my treatments of economics and long-range economic forecasting, have been consistently premised upon the following axiomatic specifications:

23. This included the teaching of a one-term introductory course on the subject of Marxist economics, at several campuses, during each term of the 1966-1973 interval. The burden of that course, was to point out the needed principal correction in Karl Marx's four-volume *Capital*: the blunders derived from his admitted, if sometimes ambiguous exclusion of "the technological composition of capitals," and those respecting the notions of "value," and of what constitutes "productive" labor, in various, mutually contradictory locations within those volumes. This was the same difference I enjoyed, on the subject of economics, in my sundry dealings with professedly Marxist organizations and academics during the 1950-1973 interval. Marx's blunder was rooted in two axiomatic features of his adult life's work. First, as in both his pre-1848 attacks on Friedrich List, and his later attacks upon Henry C. Carey, both of which he conducted at the insistence of Frederick Engels, Marx was obsessively addicted to the neo-Frondist defense of the landed aristocracy of Dr. François Quesnay, and, in defense of the financier oligarchy, to both the Venetian ideologue J. Sismondi, and to the "only scientific" secretions of such lackeys of the drug-pushing British East India

Company, as Adam Smith and David Ricardo. Second, Marx was most strongly addicted to a variety of "materialism," which combines the tradition of the ancient Greek reductionists, and Paolo Sarpi's neo-Ockhamite empiricism. On both accounts, Marx was incapable of recognizing the determining role of individual cognition in economic and other social processes.

24. As reported in sundry published locations, this study, elaborated during the 1948-1952 interval, was initially prompted by reaction against the plainly fraudulent aspects of Professor Norbert Wiener's attempt to impose his radically positivist, mechanistic "information theory," upon the content of human communications. At the beginning of the 1950s, the present writer had recognized the "ivory tower" follies of John von Neumann's "systems analysis," as genetically (axiomatically) the same thing as Wiener's bungling. The initial standpoint of the present writer was his earlier work in defense of Gottfried Leibniz's monadology, against the attacks on Leibniz central to Immanuel Kant's *Critique of Pure Reason*. In fact, as the present writer discovered later, Kant's argument was based upon Leonhard Euler's folly of *petitio principii*, in his own mechanistic attack upon Leibniz on the issue of the *Monadology*. The same axiomatic fallacy, in its guise as "linearization in the very small," is the most common of the crucial incompetencies inhering in all widely accepted doctrines of political economy today, those of Adam Smith, David Ricardo, Karl Marx, and von Neumann, et al., included.

FIGURE 4.2.3

Construction Investment and Employment

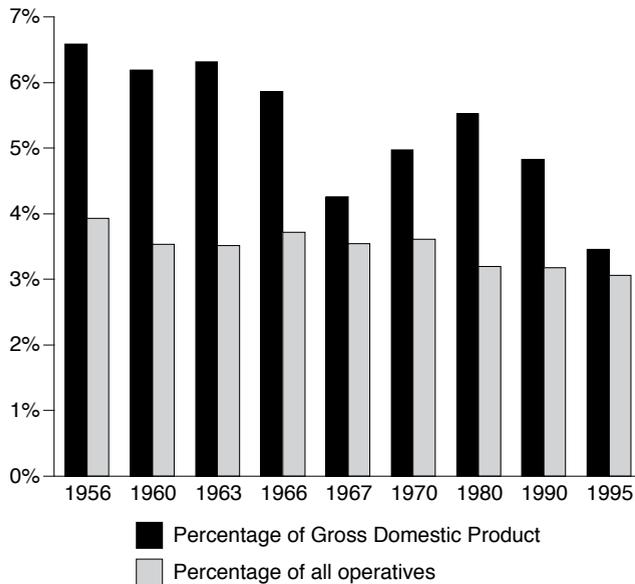


FIGURE 4.2.4

Basic Physical Infrastructure Investment and Employment



1. The sole source of increase of the human species' potential relative population-density, per capita and per square kilometer of the Earth's surface, is "anti-entropic" changes in the physical characteristics of the outcome of human social behavior, changes which depend upon continued scientific and technological progress. Not only is such progress the sole source of increase of the productive powers of labor; without such progress, human cultures inevitably degenerate, "entropically."

2. Those discoveries of principle of artistic composition, which are prompted by the defining function of metaphor in Classical modes in poetry, tragedy, music, and plastic art-forms, have an even higher degree of significance than discoveries of physical principle. Indeed, it is only when we view physical science as a branch of Classical art-forms in general, that we may comprehend adequately both physical science as such, and also recognize the mode in which both the principles of Classical artistic composition and science combine, in an indispensable way, to affect man's social mastery of nature, and to effect the variously upward, downward, or stagnating modes in culture generally and political-economy in particular. Indeed, all proper practice of statecraft is governed implicitly by applica-

tion of the principles of the greatest compositions in Classical art, to the definition of history, as history is to be viewed from this standpoint.

Let us now presume a readership which is at least moderately literate in the view of science from the Classical standpoint, as this standpoint is typified by the distinguishing, axiomatically common features of the work of Nicholas of Cusa, Leonardo da Vinci, Johannes Kepler, Gottfried Leibniz, Lazare Carnot, Gaspard Monge, Carl Gauss, Bernhard Riemann, et al. It is a readership also literate, even if not immoderately so, in the metaphor-based fundamentals of composition, specific to Classical forms of poetry, tragedy, music, and perhaps also some among the Classical forms of plastic arts. This is a reader able to think of history, as essentially the history of development and practice of ideas, that from the same standpoint as the Classical approach to physical science and art.²⁵ For purposes of optimiz-

25. The author uses the term "ideas," only in a sense entirely consistent with Plato's definition. *Ideas* are discoveries of either validated, universal physical principles, or validatable resolutions of Classical forms of metaphor in art and political history. The latter resolutions of metaphor have the same form as validated discoveries of universal physical principles. Notions sustained merely by sense-certainty, by deduction, or by

FIGURE 4.2.5

Combined Home, Car, Food, and Health Insurance Payments as Percent of Average Paycheck

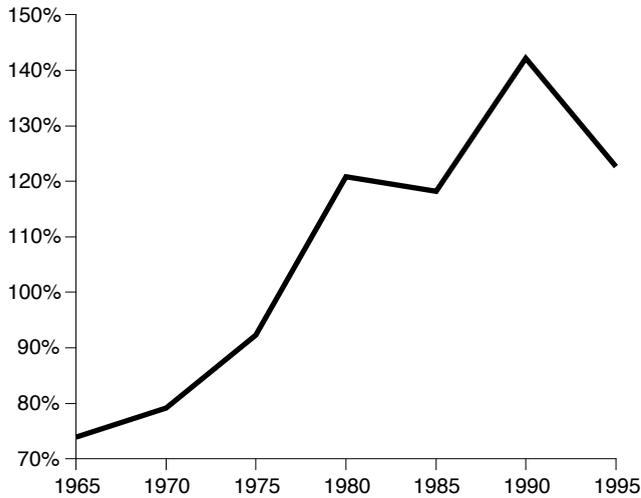
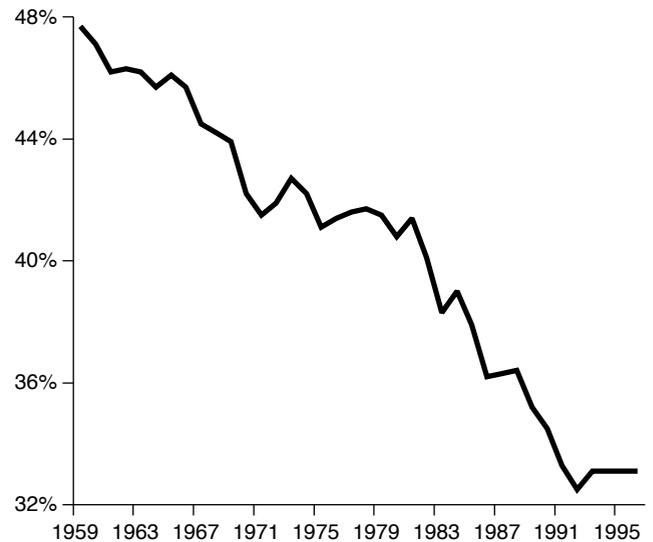


FIGURE 4.3.1

Goods-Production Portion of GDP as Percent of Total GDP



ing clarity for such an audience, here, a certain pedagogy is indicated.

That presumed, begin where I began, back during the 1948-1951 portion of my 1948-1952 study. From the outset, my adopted task was to show that Wiener’s application of his mechanistic “information theory,” both to living processes, and to human cognition, is, in both immediately implied cases, biology and cognition, absurd in fact, and wicked in its consequences for physical science, as also for general social practice.²⁶ The

symbolic argument, are not “ideas.”

26. For reasons of the epistemological illiteracy predominant in European culture since the late-Eighteenth-Century hegemony of the axiomatically reductionist, Anglo-Dutch and French “Enlightenment,” there has been a persisting difficulty in reckoning with the empirical fact, that living processes are determined by an entirely different ordering-principle, than the implicitly entropic destiny of all processes which appear to be representable in terms of algebraic functions (i.e., functions which assume Leonhard Euler’s anti-Leibniz, fraudulent, *petitio principii* defense of the reductionist presumption that linearity prevails in the very small). From Luca Pacioli, Leonardo da Vinci, and Johannes Kepler, onward, the distinction between the types of ordering which appear as the qualitative, empirical distinctions between living and non-living processes, had been a subject of fully rational inquiry. The political triumph of reductionist lunacy, during the course of the Eighteenth Century, banned rational thinking about such distinctions. Thus, the empirical fact of distinction in ordering (e.g., *mathematical [e.g., hypergeometric] cardinality*) between living and non-living processes,

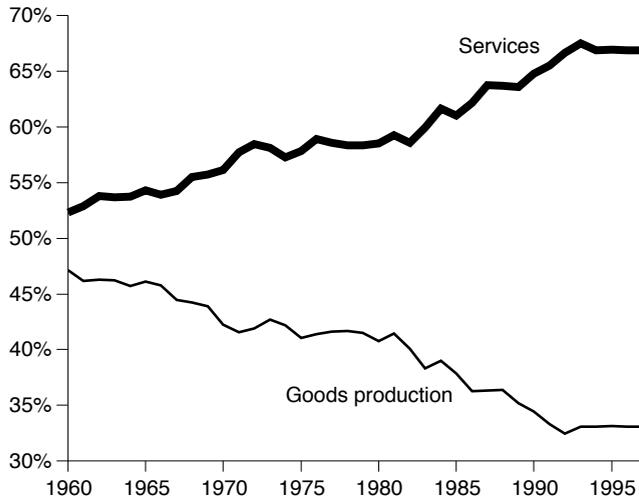
starting-point chosen for this undertaking was the subject of cognition, as we define the term “cognition” here, immediately below. The strategy for this initial

became a playground for spinning irrationally mystical, obscurantist sophistries. “Vitalism,” is an example of the irrationalities engendered by attempting to define this empirical distinction from the reductionist’s “politically correct,” algebraic standpoint. Thus, after the political hegemony of the fraudulent, reductionist notion of universal entropy, introduced, during the middle of the Nineteenth Century, by Clausius, Grassmann, Kelvin, et al., the problem of differences in ordering between living and non-living processes was broadly recognized by referring to the ordering of living processes as anti-entropic. Especially after the work of Ludwig Boltzmann, which refined the mechanistic notion of entropy in terms of gas theory, the general expression for the distinguishing characteristics of ordering, between living and non-living processes, became “negative entropy.” Sorcerer Bertrand Russell’s apprentices, Norbert Wiener, for “information theory,” and John von Neumann, for economics and “brain theory,” insisted that “negative entropy” must be derived exclusively from within the reductionist’s statistical models premised axiomatically upon the Euler-Lagrange-Laplace-Cauchy, politically correct, but fraudulent presumption of linearity in the extremely small (and, also, the extremely, astrophysically large). Thus, the contemporary radical empiricists (e.g., logical positivists such as Wiener and von Neumann) presume life to be determined within the bounds of reductionist dogma. Therefore, this is overtly, or implicitly their choice of basis for viewing life as a kind of secretion (“epiphenomenon”) of processes which may be defined statistically. They extend this same fraud to phenomena which are peculiarly characteristic of certain living species: e.g., man. So, they define “brain function” (e.g., the doctrine of “artificial intelligence”), and, therefore, also “information.”

FIGURE 4.3.2

Gross Domestic Product, by Component: Goods Production versus Services

(percent of total GDP)



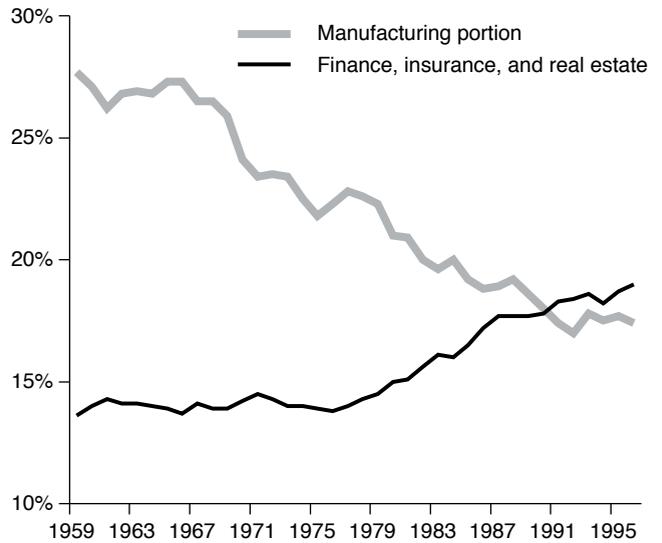
phase, asserted the empirical effects of cognition between two seemingly parallel, but actually coinciding expressions of validatable, original discovery of principle: discoveries, or re-discoveries²⁷ of validatable new physical principles, and ideas generated as validatable resolutions of Classical metaphor. During the work on this project during the 1948-1951 interval, the two tracks were developed in parallel, and then brought together. Later, in 1952, the work of Bernhard Riemann was taken into account, as providing the needed strategy for introducing notions of measurement, into the discoveries which had been developed up to that point.

The role of physical science in physical economy, as the latter is axiomatically distinct from empiricist schools of political-economy, was the original benchmark chosen for these studies. The actual experience of the modern industrial process, was the context for the initial attack upon the issues implied. In other words, the “machine-tool principle,” as implied by the work of Leibniz, and as introduced to generalized practice,

27. E.g., as by students in a Classical-humanist mode of education, in which students are not permitted merely to *learn* physical and artistic principles, as from textbooks and classroom lecture-notes, but are obliged to *know* them instead. To *know* a principle means to re-enact the original discoverer’s mental experience of generating that conception. In the case of the student trained in the latter mode, that person does not rely upon eidetic memory of a learned formulation and procedure; instead, that person’s mind regenerates the conception, rather than calling it up from “memory banks.”

FIGURE 4.3.3

GDP, by Component: Manufacturing vs. Finance, Insurance, and Real Estate

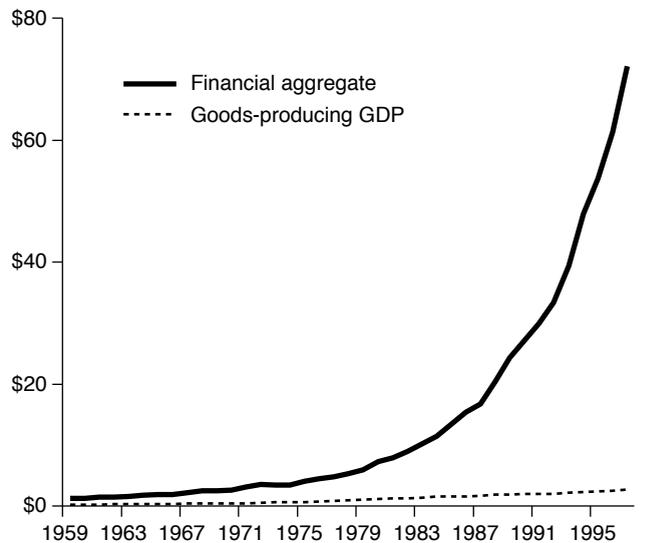


during 1792-1794, by France’s Lazare Carnot. The pivot of this phase of the study, was the fact soon known to any reasonably intelligent university undergraduate: that a well-designed apparatus, which provides proof-of-principle demonstrations for a newly discovered physical principle, is the pivot by means of which validated discoveries of physical principle, are translated

FIGURE 4.3.4

Financial Aggregate’s Growth versus Growth of Goods-Production GDP

(trillions \$)



into those new designs of products and processes, by means of which, in turn, the per-capita and per-square-kilometer productive powers of labor are advanced.

The flow-chart presented here as **Figure 5**, illustrates the nature of the connection between validated discoveries of new physical principles, and the technological progress, in the form of man's increased power over nature, per capita and per square kilometer of the Earth's surface, into which these discoveries lead. I now summarize the immediately relevant features of my argument on this subject, as given on numerous earlier occasions.

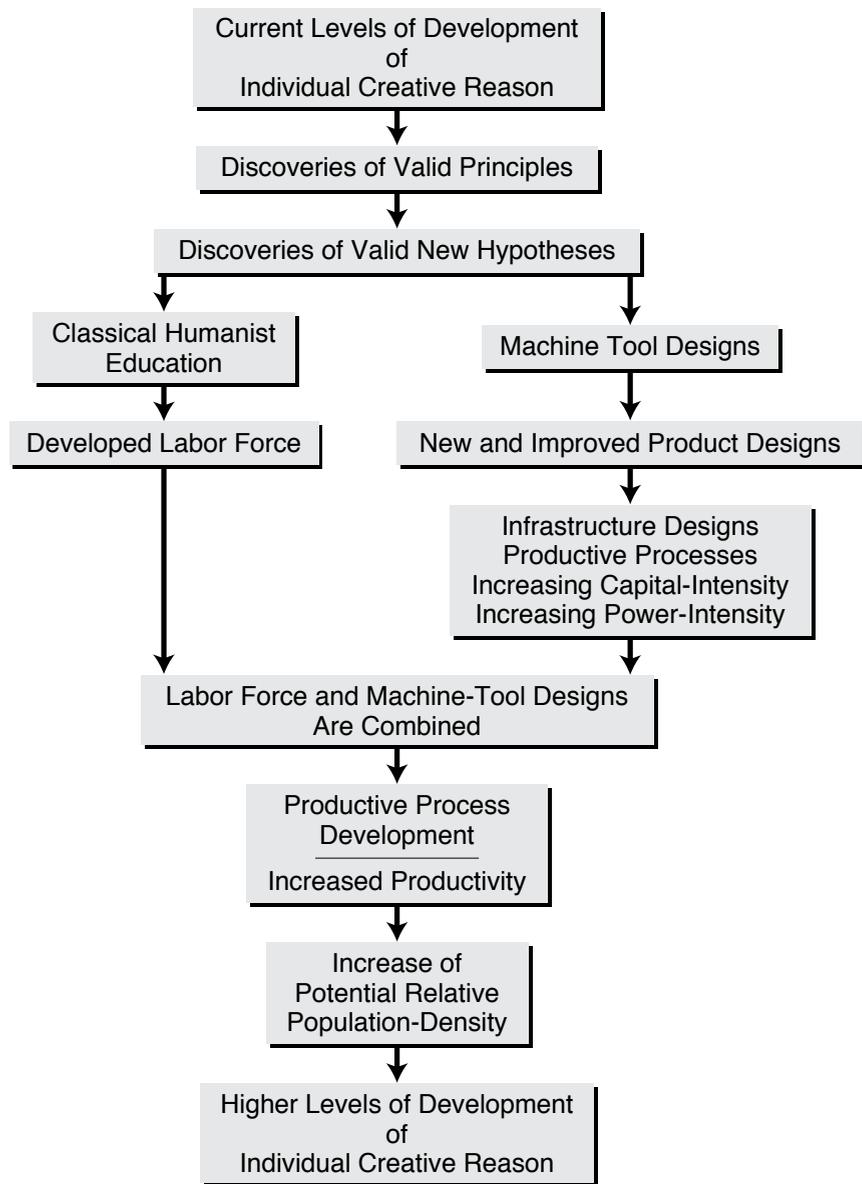
If one attempts to describe the effect of repeated such insertions of new technologies, into the physical-economic process of the society/economy taken as an indivisible whole process of the human species' self-reproduction, the following result appears immediately.

1. The potential increase of the potential relative population-density of a society,²⁸ is bounded by the number of valid, implicit, discovered physical principles known, and thus available to be expressed in the form of applicable new technologies of individual and social practice.

2. However, the realization of the benefits of discovery and proliferation of scientific and technological progress, is conditional upon the way in which social relations define the

28. This is not limited to the simple number of persons in a population which is self-sustained through technological progress. The increase in potential, per capita and per square kilometer of the Earth's surface, is conditional upon related improvements in the demographic characteristics internal to households, in addition to the demographic characteristics of population more simply defined. This multiply-connected function is also conditional upon the improvements of land-area, as through development of basic economic infrastructure. The function so implied, is conditional upon maintaining the rate of growth of potential relative population-density so defined.

FIGURE 5
The Machine-Tool-Design Principle



communication of validated products of cognition, and in which social relations themselves are ordered to this ultimate effect.

The deepest challenge to comprehension posed by these historical facts, is concern for knowing the *ontological* nature of individual human cognition itself. That task is a fully comprehensible one, at least respecting all its axiomatic measures, if one approaches the matter as I did, throughout the 1948-1952 interval. I

approached this task from the standpoint of refuting Immanuel Kant's devotion of his life's work, especially of his last decades', to defaming Gottfried Leibniz.²⁹ Leibniz's view of these matters, which I defended, and employed for the both the initial, 1948-51 study, and for its 1952 sequel, is a modern affirmation of the notion of the *idea* also specific to the Socratic dialectical method of Plato. For the purposes of our topic here, the crucial significance of this point is as follows.³⁰

Usually, the original, or pedagogically replicated discovery of a validated, universal physical principle, is prompted by a perplexing paradox of the following, ontological type. For this purpose, assume the history of the internal development of European science, from Egypt, through Classical Greece,³¹ through the succes-

29. During the 1948-1951 interval, for the purposes of that project itself, the author's references to Kant's work were almost entirely focussed upon the *Critique of Pure Reason* and a few collateral writings. The writer's view was informed by his adolescent commitment to defense of Leibniz's principle of *monadology* against Kant's attack, there, on this and closely related features of Leibniz's work. (Also, Leibniz's related principle of the universality of non-constant curvature in the extremely small interval of action.) Originally, Kant had been Prussia's leading disciple of Britain's David Hume, and a rabid adversary of Leibniz from that standpoint. As Kant indicates in a report featured within his *Prolegomena*, he turned away from Hume, when Hume, later, adopted a more radically empiricist view in respect to "moral philosophy." Kant did not drop his enmity toward Leibniz at that point, but, rather, resorted to a pure-and-simple Aristotelean standpoint, rather than Hume's more radically Okhamite standpoint. The Classical attack upon Kant's later work, notably on the issues of morals and aesthetics, is that of Friedrich Schiller.

30. Here follows a recapitulation of the same argument supplied on pages 47-51 of the referenced earlier report.

31. Although Greek civilization had depended chiefly upon Egypt for the foundations of its own progress, Classical Greece added a crucial element, an element not visible in specialists' reports of their studies of ancient Egypt. The simplest indication of that distinction, is the comparison of Greek Classical sculpture (e.g., Scopas, Praxiteles) with its Archaic Egyptian and Greek predecessors. The difference between the Archaic and the Classical, is the conscious employment of the principle of the *idea*, as Plato best represents conscious use of that principle. Certainly, *ideas*, so defined, existed in all those changes which increased, directly or indirectly, all the human species' progress in increased potential relative population-density; the distinction of Classical Greek culture, is both the appearance of consciousness of the principle of the *idea* as such, and, decisively, the role of such consciousness in enabling mankind to secure conscious, willful control over the process of fostering and employing such *ideas*.

With respect to Asia, the case is less clear. There is intimation of the notion of an *idea*, in Panini's treatment of the Vedic-Sanskrit, an intimation which correlates with the long-cycle features of early Vedic (e.g., 6,000-4,000 B.C.) solar-astronomical calendars. In contrast, early Mesopotamian lunar astronomy is defective, relative to Greek, Egyptian, and Vedic-Sanskrit cultures. Recent developments in China, create the

sion of leading intellects of the Platonic Academy of Athens, and related cases, such as Archimedes, into the founding of modern experimental physical science through the influence of such writings as Nicholas of Cusa's *De docta ignorantia*.

Given, a notion of geometry as exemplified by the practice of Plato's Academy.³² Also, given, Cusa's emphasis upon a notion of a science susceptible of representation in terms of measurement, and in the form of a geometrically-based mathematical description of measurable results. Given, such a case, in which the previously established physical science of reference, was already premised upon experimental proof-of-principle measurements. Now, take note of the increasingly frequent case in the history of modern European science, in which nature presents an empirical case, which all then-extant, accepted science appears to have been ordained to have been impossible.³³ For pedagogical purposes, take the case in which none of the array of specific, universal physical principles previously adopted is invalidated, except in the respect that the assembly of those principles, taken as a whole, appears to exclude the possibility of the troubling empirical evidence.

If the empirical evidence supporting, respectively, the "old physics" and the reality of the contrary phenomena, are equally valid, empirically, then no deductive or statistical-mathematical solution for the contra-

circumstances in which the study of early Chinese culture's roots, from this standpoint, should be placed on the agenda; the general impression of what might be found, is positive.

32. For this purpose, the contemporary and correspondent of Archimedes, the Platonic Academy's Eratosthenes, provides a bench-mark.

33. For model cases, two are implicitly referenced illustrations in the structure of this argument. The first is the empiricist Leonhard Euler's *petitio principii* hoax, attacking Leibniz's *Monadology*: Euler's fraudulent denial of Leibniz's demonstration of the implicit universality of non-constant curvature in the infinitesimally small. Euler's fraud was effectively overturned by the development of principles of hypergeometry, successively, by Carl Gauss and Bernhard Riemann. Note Gauss's precedence in his discovery of the orbit of the asteroid Ceres, and Riemann's 1854 habilitation dissertation, *Über die Hypothesen, welche der Geometrie zu Grunde liegen, Bernhard Riemanns gesammelte mathematische Werke*, H. Weber, ed. (New York: Dover Publications reprint, 1953). The second is the work of a collaborator of both Gauss and Riemann, Wilhelm Weber, in his proof-of-principle demonstration of the absurdity of J. Clerk Maxwell's politically-motivated exclusion of the Ampère "longitudinal force" from Maxwell's account of electrodynamics. On the latter see Laurence Hecht et al., "The Significance of the 1845 Gauss-Weber Correspondence," *21st Century Science & Technology*, Fall 1996. The latter case will be expanded by ongoing attention to the related implications of the work of Ampère's collaborator, Fresnel, respecting the principles of electromagnetic propagation, including so-called "gravitational waves."

diction exists. The conflict is thus defined as an *ontological paradox*, in the sense illustrated by Plato's *Parmenides* dialogue. As Plato emphasizes, in that and other locations, the failure of the Eleatic reductionist school of Parmenides (like the school of Plato's adversary, Aristotle, later) is located in the axiomatic inability of deductive-reductionist modes of thinking, their intrinsic inability to comprehend the process of change, which bridges the genetic change separating a relatively superior, from a relatively inferior species of scientific or other thought.³⁴ That factor of change takes us out from the bounds of deductive method; no deductive method can master such a challenge.

Nonetheless, the problem is not an insuperable one: all fundamental scientific and Classical forms of artistic progress, alike, attest to the existence of that faculty of the individual person's cognition, the which, adequately developed, can infallibly solve any ontological paradox, rooted in a validated conflict of empirical evidence. This faculty is the characteristic, implicitly "anti-entropic" principle of action, the which is expressed by a well-developed capacity of the individual's cognitive powers.

The difficulty is, that while we enjoy well-established notions of experimental proof-of-principle, by means of which we can test the validity of a proposed solution to such a paradox, there exist no possible means, by which the sense-perceptual apparatus of an observer could comprehend the mental processes, by means of which that validated principle itself was generated. Nonetheless, there are other means available to experimental physical science, through aid of which those processes can be known directly by another mind.

34. "Genetic" is employed here in the sense of the meaning Plato supplies for use of the term *hypothesis*. Use the geometry of Euclid as the background against which to define "hypothesis." In such a geometry, the ultimate test of whether an empirically plausible proposition may be adopted as a theorem of the geometry, is its lack of inconsistency with any among the set of definitions, axioms, and postulates, consistently underlying that geometry at each and every possible location within the geometry as a whole. Such a set of definitions, axioms, and postulates, or any substitute for such a set, defines an hypothesis. Each case, in which a new discovery of principle obliges us to change one or more among the set of definitions, axioms, and postulates of a pre-established hypothesis, generates a new hypothesis, which has no deductive consistency with its predecessor. Such orderable successions of hypotheses, imply a parallel to the evolutionary development of mutually distinct, successive species of living creatures. In both cases, the measurable impact of success, is of the form of true "anti-entropy," not the silly definition of "negentropy" employed by Wiener et al. for so-called "information theory."

If two minds generate a common, experimentally validated solution for such an ontological paradox, the common validation, provides one of those minds certain knowledge that the relevant mental process experienced in his, or her mind, was the same type of mental process which occurred in the other mind.

Thus, we have the picture displayed by the flow-chart presented here as **Figure 5**. In modern agro-industrial society, the most important medium for transforming validated discoveries of physical principle into man's increased power over nature, per capita and per square kilometer, is the role of the machine-tool-design principle, as outlined by this flow-chart.

Focus upon the function which education must fulfill, in order that the continuation of such progress can be predetermined. Conversely, what we have to say, on this account, here, may be rightly taken as also pointing to the moral and intellectual bankruptcy of popularized recent changes in policy of public and higher education. The view of education expressed here, while admittedly viewed as an egregious one by current "mainstream opinion," is key for comprehending how the mind works, and for understanding the principles upon which competent long-range forecasting depends, that absolutely.

Classical Humanist Education

The essential empirical distinction of the human species from all lower beasts, including, presumably, that professed great ape known as the Duke of Edinburgh,³⁵ is the relevant archeological and other evidence of human existence, dating from, implicitly, more than a million years ago.³⁶ The principal evidence

35. Prince Philip's claim, that the natural father of his children was a great ape, pertains not to the suggestive form of Prince Charles' ears, but to the nature of Prince Philip's co-sponsorship, with ex-Nazi Prince Bernhard of the Netherlands, of both the 1961 founding of the pro-bes-tial World Wildlife Fund (WWF), and of the revival of Edward VII's "Club of the Isles," as the "1001 Club," the organization created for propagating and funding the spread of the WWF's effort to de-nature the human species. See Mark Burdman, "'Jury' Votes Equal Rights to Apes," *Executive Intelligence Review*, Jan. 26, 1996.

36. The evidence of a perfected design of throwing-spear, dated to an ancient site deep within a mine in Germany, is typical of the evidence pointing to the implied existence of the specifically human genotype, as early as between one and two millions years ago. As in long-range economic forecasting, so in paleontology, it is not sufficient to consider the genetically determined form of hominid-like types; one must seek evidence which could not have been produced except by those kinds of cognitive processes, which set the human species absolutely apart from, and above the higher apes. Compare this with the method identified in

of this distinction, is the combination of artifacts which meet the experimental-scientific standard of technologies necessarily born of valid discovery of physical principle, or, which are works conforming to Classical standards for artistic composition.³⁷ Like the comparison of two observed trajectories of a celestial entity, the congruence of a suspected paleontological specimen of humanity with actual humanity, requires credible agreement in respect of form, but, also, evidence of the relevant, specific, non-linear characteristic of practice. Not accidentally, this is also the principle of competent, long-range economic forecasting.

In respect to physical science, this historical view of the human species' cultural self-development, is marked by a series of known, or necessarily implied particular, validated discoveries of principle. Among the earliest truly interesting expressions of this, are ancient solar-astronomical calendars, containing reasonably accurate long cycles of a thousand years or much more. The pre-Vedic and Vedic such calendars, internally dated to earlier than 4,000 B.C., as addressed by Bal Gangadhar Tilak, are exemplary.³⁸

Lyndon H. LaRouche, Jr., "Any Enemy of LaRouche Is an Enemy of Clinton," *Executive Intelligence Review*. April 3, 1998. See the section subtitled, "Look to the stars," pp. 28-29. A chimpanzee is able to learn, and to transmit to offspring, the use of a stick for gathering termites, etc.; the chimpanzee could not discover a physical principle of the type underlying a family of synthesizable technologies. Hence, the design of an ancient throwing spear may serve, as in the cited instance, as dating the existence of a mind of the modern human type.

37. My use of "Classical" always conforms to the standard of Classical Greece, and, most emphatically, to the principle of the *idea* as defined by Plato's method of Socratic dialectic. In respect to art, this always signifies, that the method of characteristic feature of action expressed by the composition of the artistic work, is Classical metaphor, that of the type banned by empiricist Thomas Hobbes, et al. The contrast of Greek Classical art, on this account, to preceding Archaic forms of Egyptian and Greek plastic art-forms, is exemplary.

38. *Orion, or Researches into the Antiquity of the Vedas* (1893), and, its sequel, *The Arctic Home in the Vedas* (1903). Tilak employed studies of Vedic astronomy supplied from German astrophysicists, chiefly from the circles of Carl Gauss. Johannes Kepler was among the first to recognize the astrophysical significance of very long cycles in Vedic solar-astronomical calendars. In contrast to the Vedic-Sanskrit and Egyptian astronomy, that of Mesopotamia is relatively degenerate; like its wicked theology, ancient Mesopotamia leaned more to the lunatic side of precise accounting practices, than the epistemological spirit of scientific inquiry. Curiously tangled, are the facts, that the rudiments of civilization were introduced to the savages of ancient Mesopotamia by the Dravidian colonists from "Harrapa" culture, who established Sumer. Thus, the satanic form of religious belief—the cult of Ishtar—specific to Akkadian culture, is, like the kindred religions of ancient Sheba, Ethiopia, and Canaan, and the Hellenistic cult of Isis-Osiris, a reflection of the Shakti-Siva cult, as Herodotus accurately pin-points the Dravidian ori-

In respect to developed notions of physical science as such, we have the legacy of European Classical-humanist modes of education, such as those practiced by the Brothers of the Common Life, or the Schiller-Humboldt program employed for Nineteenth-Century, and later, German Classical secondary education. That education traced the origins of modern European physical science, from its Classical Greek roots, using a notion of mathematics centered upon the reflections of the work of the school of Pythagoras, of Thales, and of Plato, in the Thirteen Books of Euclid. It employed that same method in search of the relationship between Classical Greek developments, and those of relevant non-Greek predecessors. Out of this approach, modern European civilization developed a rather precise insight, into the notions of which validated discoveries of physical principle must be viewed as successors of some others, and forerunners of still others.³⁹

In principle, the potential for a similar sense of ordering of discovery of Classical-artistic principles exists, but is far less developed than is the case for the mathematical-physics domain.⁴⁰ Nonetheless, in the

gins of the pagan religions of Mesopotamia, Sheba, and Canaan. On this and related accounts, the fusion of the Vedic culture from Central Asia, with the technologically advanced Dravidian, maritime culture of Harrapa, etc., contains some riddles of significance for understanding the state of humanity in the Indian Ocean littoral, during the long period, during and immediately following the last great cycle of glaciation. Happily, the conclusions we employ here are not encumbered by such fascinating riddles.

39. One might say, a notion of the *cardinality*, in the sense of the Sieve of Eratosthenes, associated with such ordering of discovered principles.

40. Paradigmatic, is the case of the sequence for Classical music: J.S. Bach, Josef Haydn, Wolfgang Mozart, Josef Haydn after approximately 1786, Beethoven, Schubert, F. Mendelssohn, R. Schumann, and J. Brahms. Once the significance of implicit intervallic inversions was more adequately appreciated, the development of a rigorous polyphony attuned to the natural mode (e.g., Florentine *bel canto*) of the human voice, required the development of polyphonic-voice-determined well-tempered scales set at C=256, rather than the merely equal-tempered values which might be thought to meet the requirements of keyboard instruments. This development of well-tempered polyphony by Bach, already produced the germ of later Classical motivic thorough-composition in Bach's compositions, most notably in such scientific-artistic breakthroughs as Bach's *A Musical Offering*, and the principles of mastery of the role of inversions in well-tempered polyphony, in his *The Art of the Fugue*. Indirectly, as Maestro Norbert Brainin discovered, this led Haydn to the first formal use of this new method of composition in his Opus 33 "Russian" string quartets. Haydn's Opus 33 prompted Mozart to recognize a more advanced version of this approach to motivic thorough-composition, as already realized in essence by J.S. Bach's *A Musical Offering*. Haydn, in turn, then adopted his former student's, Mozart's, discovery in his later works. Beethoven, a student of J.S. Bach's work, adopted Mozart and Haydn, successively, as his chosen teachers.

Classical educational program's artistic curriculum, the principle of education was the same. The student must not *learn* the description of the principle, or the mere use of procedures associated with it; the student must, in his, or her own mind, re-enact the personal, private mental experience of the original discoverer, the strife of resolving ontological paradoxes, that strife which is the form of mental activity from which every valid discovery of principle—in science, or art—is derived.

As in science, so in the domain of great Classical artistic compositions, the student whose talent is developed by Classical-humanist, rather than “drill and grill” modes, *usually* knows the name of the person, whether from the present century, or even several millennia past, who is identified as the original discoverer of reference. That student *always* knows the ontological paradox whose solution is the discovered principle: otherwise, the student could not have experienced the relevant mental act of discovery; otherwise, the student does not *know* the principle, but, at best, has merely tucked it into his “memory banks,” has merely *learned* it as mere “information,” not knowledge. The graduate of such education also knows which principles of science, or art, or both, he, or she, must have known, prior to undertaking the solution for the relevant paradox. In all such cases, the name for ontological paradox in Classical art-forms, is *metaphor*.

Thus, there are three qualities included in a former student's knowledge of any validated principle of science or art. First, the identity, perhaps even the actual name of the original discoverer of the principle. Second, the paradox, or metaphor, which prompts the regeneration of the principle. Third, the prerequisites for undertaking the attempted solution of that paradox, or meta-

He perfected Mozart's original discovery, establishing this derivative of Bach's work and influence as the foundation for all Classical motivic thorough-composition, through the concluding composition by Johannes Brahms, and beyond. None would have been possible, without the work of his relevant predecessors. The same applies to Classical tragedy, in the succession: Aeschylus, Shakespeare, and Schiller, each of whom rested explicitly on the work of the relevant predecessors. In poetry, without the Classical Greek models, as opposed to the predominantly more trivial Latin models, Classical European poetry would not have come into existence. In plastic art-forms, without the revolution exemplified by the transmissions of the revolutionary principle, away from the Archaic, provided by the work of Scopas and Praxiteles, a Leonardo da Vinci, Raphael, or Rembrandt, would not have been conceivable. Rather than “four-square” tombstone designs, or pathetically symbolic “primitives” with no coherent principle, the Classical plastic art-forms express a degree of metaphorical imbalance, which forces the mind to adduce motion—change—rather than a naive, static imagery.

phor: the notions of *ordering* and *cardinality* common to both physical science and Classical art.

These considerations, integral outgrowths of the 1948-1951 phase of my work on the project, led to 1952 studies of the work of Georg Cantor,⁴¹ and, then, the rereading of Riemann's 1854 habilitation dissertation⁴² as an alternative to Cantor's approach to the notion of the “transfinite.”

The problem posed by the outcome of the 1948-1951 interval, was: how to express the progress flowing from scientific and artistic progress, in functional terms which might be correlated with relevant measurements. The fact, that both scientific and Classical-artistic principles, represented an implicitly orderable sequence of expanding, multiply-connected manifolds, was key to the solution. Riemann's recasting of both Leibniz's and Gauss's preceding work, on the overcoming of the fallacies inhering in an aprioristic form of geometry, provided the key for solving the problem. Most notable was Riemann's explicit freeing of physics from the shackles of formalist mathematics: the notion of the unique, experimentally determined relationship between an n-fold physical manifold, and some measurable characteristic of action within the physical domain actually corresponding to such a manifold. In other words, with each discovery of principle, we must create a new mathematics, to replace the old, and must determine the characteristic of action within that new manifold experimentally, as Wilhelm Weber, for example, did for microphysics, in the instance of his experimental proof-of-principle for Ampère's “longitudinal force.”⁴³

In this connection, I added two new features to the Riemannian form of representation of a physical-economic hyper-manifold, determined by scientific and technological progress. The less revolutionary of these two additions, was the use of my own definition of physical-economic anti-entropy, in terms of a form of systems of simultaneous inequalities, whose result may be represented in linear terms, but which is not linked functionally to any linear system.⁴⁴ The second, which is, formally, far more radical, of course, was to superimpose an m-fold manifold, of discoveries of Classical-

41. Georg Cantor, *Beiträge zur Begründung der transfiniten Mengenlehre*, in Ernst Zermelo, ed., *Georg Cantors gesammelte Abhandlungen* (Hildesheim: Georg Olms Verlag, 1962).

42. op. cit.

43. op. cit.

44. *So, You Wish to Learn All About Economics?* op. cit.

artistic principles, including principles of history in the large, upon any given n-fold manifold of validated physical principles. Thus, I redefined experimental science, as the experimental testing of the validity of principles of Classical art and history, in terms of the human species' required, anti-entropic form of increase of its per-capita, per-square-kilometer power over the universe.

With the combining of those two elements, in that fashion, I shifted the question from the experimental testing of a presented candidate to become a scientific principle, to a testing of the validity of those cognitive habits, by means of which both successful discoveries of principle, and the experimental validation of those discoveries, are generated by the individual human mind. In other words, the primary subject-matter became that which can be known, but can not be represented in terms of sense-perception.

This brings Classical education back into focus, once again.

In the process of Classical education, the student re-experiences original discoveries of physical principle, Classical art-forms, and history itself, as if the student had been the relevant original discoverer. The scope of this education reaches, implicitly, toward the contributions to knowledge of principle gained by all previous human existence. Although the number of principles known in this way, may be limited, they are representative of the net outcome of the history of knowledge to the present time. The student becomes, thus, in that degree, a living embodiment of all prior human existence: *an actual world-historical individual*.

That has a directly relevant connotation for the matter immediately at hand. In the given case, the student is doing something far more profound, than merely coming to *know* (rather than merely having learned) a collection of validated principles. The student has repeated the act of successful cognitive solution for paradoxes (e.g., metaphors). In this way, the student has relived the relevant movements, from within the mind of the relevant original discoverer. The graduate of such an education must be cautious in his, or her selection of a future mate, lest he or she come to find, that one knows the most intimate facets of moments from the minds of many original discoverers, far better than one knows who is really behind the face of one's marriage-partner. The relevant student has repeated many times the greatest experiment of all, to prove the validity, the reliability of that agency which

is the cognitive creative powers of the individual human mind, the powers better understood, only when one has perfected them considerably through many, many honings of their cutting edge.

This role of Classically-educated cognition, comes into focus in science and society, once we attempt to locate the "in-betweenness," which connects two, successively developed, formally inconsistent manifolds. How does something higher, develop out of something lesser? How does something totally irreconcilable, deductively, with its starting-point, develop out of that starting-point? Obviously, no manifold produces such successors. The transformation occurs from outside that original manifold, a transformation which is caused by, and which conforms to those creative cognitive processes which correspond to no sense-perceptual representation. It is the development of those innate potentials for successful creative cognition, which is the only valid purpose of a good education. The student so benefitted, comes to the state of familiarity with, and experimentally grounded confidence in those specific, sovereign cognitive powers of the developed individual mind, in which he, or she is able to call those powers into play, once again, at will.⁴⁵

Restate this crucial point. What is the ordering-principle, which governs the successful generation of a validated new manifold, out of the prompting of this discovery, by the ontological paradoxes of the superseded manifold? What is the agency which performs this action? It is the developed cognitive powers of the individual human mind, cognitive powers which absolutely defy simply sense-perceptual, or algebraic forms of representation. *This transformation is the source of anti-entropy, contributed to the physical-economic and related social processes by individual cognitive creativity.*

There is a further implication in that. The peculiarity of man's relationship to the universe at large, is expressed most succinctly, by the fact that whenever the human cognitive processes generate a validatable discovery of principle, the universe is so designed that it is

45. A couple decades past, Dr. Stephen Pepper chanced to meet the Dr. Lawrence S. Kubie on whose work I had bestowed much praise: qualified praise, but, despite his association with Freudian psychoanalysis, well-deserved praise. In the course of the brief exchange between Pepper and Kubie, Kubie insisted, quite rightly, that creativity is a good in and of itself. If we may read that observation as consistent with what I have just stated here, the late Dr. Kubie was certainly correct in that opinion.

self-obliged to submit more fully to mankind's will on that specific account. It is this anti-entropic quality characteristic of the individual cognitive processes, which is the source of the power compelling such obedience from nature. *Such is the nature of the fundamental ordering principles of the universe.*

The Morality Of Classical Education

Until the Jacobin atrocities launched in France, beginning July 14, 1789, the most moral citizens of Europe were inspired by the example of the U.S. Declaration of Independence, the ensuing struggle for liberty against the evil tyranny of the British monarchy, and the U.S. Federal Constitution. To any literate German—the members of the pro-U.S.A. *Lesergesellschaften*, for example—the Declaration of Independence and Preamble of the Federal Constitution, were reflections of the anti-Locke philosophy of Gottfried Leibniz. At the outbreak of the French Revolution, these republican strata of Europe hoped that the result would be the rapid spread of the U.S. example into Europe. With the increasingly menacing atrocities led by such Anglophile revolutionaries as Maximilien Robespierre and the Duke of Orléans, Philippe Egalité, and then, the escalation of the Terror under outright British agents Danton and Marat, a terrible depression settled upon Europe over the years 1789-1794, preceding the July 1794 toppling of the terrorist regime of Robespierre and Saint-Just.

To translate somewhat freely Friedrich Schiller's famous remark on these developments in France: "A great moment has found a little people." The want of a moral development in the French population, had turned opportunity into catastrophe. On this account, Schiller led in pointing to the importance of a Classical education of the population, education based upon not only science, but also the role of great examples of Classical art-forms, in effecting the moral education of the mental faculties. Unfortunately, especially since the cultural downshift of 1964-1972, the which has been accompanied by a virtual extinction of popular participation in Classical art-forms, a state of widespread moral illiteracy, has become "mainstream thinking" in both Europe and the Americas. Once again, a great moment of crisis, a great opportunity for long-needed change, finds among the leaders and population of these nations, a "little people," akin to the perilous moral condition of the 1789-1794 population of France.

Under such conditions, only the most exceptional

type of leadership, can successfully guide a self-imperilled nation, or nations, to an historical place of safety. In such a circumstance, such qualities of leadership are distinguished for the egregiousness with which their proposed, indispensable remedies, are regarded, and resisted by both leading institutions, and much of the population in general.

These kinds of problems were already evident in the U.S. population and institutions during the pre-World War II decades. The influence of pragmatism upon public and higher education, was part of the morally corrosive influence, responsible for undermining the popular moral faculties. More broadly, there was the spread of populism, which placed ignorant, and usually false, commonplace opinions and tastes, above relevant cultivated knowledge. The most widespread fear was the fear of becoming "unpopular," of expressing "unpopular opinions," exhibiting "unpopular" tastes. The adolescent girl or boy, usually prized becoming "the most popular" of their gender, and usually feared—sometimes to the extreme degree of social-theorist Emile Durkheim's notion of *anomie*—a lack of such status. The desire of most such young folk, of my own and the succeeding generation, to be something worthwhile, was superseded by a pitiable, romantic fascination with looking like, or smelling like, some movie-idol. The essential moral quality, the strength to stand alone for truth and justice, against wrongful popular opinion, was undermined, and, after developments of 1964-1972, virtually, lost somewhere in a vast stinking swamp of "political correctness."

These matters belong to what I have identified here, as earlier, as the m-fold set of artistic postulates, which shape the way in which the mind guides both the cognitive act of validatable discovery, and the way in which social relations react to such discoveries. Look at the internal dynamics of Classical artistry from this point of reference. After a relatively brief treatment of that sub-aspect of our topic here, we shall return, prepared, to examine the nature of the interactions between the m-fold and n-fold manifolds.

Take the case of performance of Classical musical compositions. Look at the moral root-difference between a Classical performance of Bach, Mozart, Beethoven, Schubert, Chopin, Schumann, or Brahms, and an attempt to read such a composition in the Romantic mode, as if it had been composed by Franz Liszt or Richard Wagner. The essence of the difference in approach, is between an *agapic* passion, like that associ-

ated with the joy of effecting a valid scientific, or related discovery of truth, or realization of justice denied—as against the alternative, *erotic* passion of mere sensual effects.

To this end, consider the case of the Classical composition: The performer's or performers' attack upon the opening tone and first interval of the composition is decisive. The beginning of the composition defines a musical statement, which serves as the take-off point for the process of development of the composition in its polyphonic entirety. The performer must not only seize the audience's attention at the outset, but must grip that attention in a way consistent with the process of development which, in the end, becomes the idea of the composition as a unified, indivisible entirety. The late Wilhelm Furtwängler was a master of this.

This problem confronts the Classical performer in one way, and the Romantic in another; despite the differences, the attack upon the opening, is more or less decisive for the audience's apprehended artistic impact of the composition as whole. In the first instance, the Classical evocation of *agapē*,⁴⁶ is associated with the characteristic feature of great Classical compositions, since the relevant work of J.S. Bach: motivic, polyphonic thorough-composition. This reflects, thus, the quality of anti-entropy. In contrast, the anarchic sensualism of Romantic, Modern, and post-Modern art, appeals only to a linear emotion, that of lust and rage.

At first reading of my argument here so far, it might be suggested that art is only another expression of the same quality of discovery, met in validated discoveries of physical principle. That would be a superficial interpretation of the actual connections between science and Classical art. By physical science, we mean the relationship between the individual cognitive processes, and the individual's ability to act efficiently upon the physical universe. In art, we employ the same cognitive faculties, to the same included effect, but with crucial social dimensions added.

From the standpoint of validated original discoveries of physical principle, the first social problem encountered by a valid discovery, is the challenge of replicating that cognitive act in the mind of another person.

46. *Agapē* as defined by Plato, the passion which compels one to accept nothing less than truth and justice, is the same quality of *agapē* referenced by the Apostle Paul's *I Corinthians* 13. It is, therefore, the passion for truth, which supplies the needed energy for the quality of concentration required to transform an ontological paradox, or Classical metaphor, into a validatable discovery of principle.

I.e., Classical modes of education. The leading consideration is, that the cognitive processes of cognitive discovery by one person, can not be perceived, nor represented within the bounds of sense-perception. The only way those cognitive processes can be defined as a mental object of knowledge, is to replicate the validated process of discovery by another, in one's own cognitive processes. It is this deeper aspect of human social relations, rather than the form of relations located within the more superficial domain of sense-perception, which is the essential character of social relations overall.

Thus, in art, we apply the quality of cognitive passion associated with validatable discoveries of physical principle, to social relations as such. The general theme of this interplay, is the conflict between the agapic passion of creative cognitive processes, and erotic impulses associated with mere sensuality, with sense-perception as such. The characteristic problem, so posed, is the struggle to maintain the agapic mood's efficient subordination of erotic impulses to agapic purposes.⁴⁷

In Classical art-forms, this social relationship is expressed always as a metaphor. This is the "To be [*agapē*], or not to be [*eros*]," of the Third Act soliloquy by Shakespeare's Hamlet. Or, in Schiller's counsel, the audience departing the theater after the performance of a Classical tragedy, must leave the theater better people than they had entered it. These desiderata are the key to all great Classical artistic compositions. It is the reading of history from this Classical-artistic vantage-point, which is the truth of history. It is the same, differently located, in Classical musical composition, as best exemplified by the greatest Classical polyphony.

Thus, so informed by Classical art, we approach the practical matters of life with our passions made literate. The motive so supplied, is to realize truth and justice in society. The notion of truth and justice is located in an (agapically) impassioned prescience of the necessity for that anti-entropic progress of mankind, which is the characteristic of the agapic, otherwise known as creative-cognitive mood.

Art and Hypothesis

The scientific approach to physical economy, is motivated by concern to foster forms of progress which improve the potential relative population-density of

47. If you will, you make take this as a reading of Paul's *I Corinthians* 13.

mankind. This improvement depends upon what we call investment in scientific and technological progress, which means, in the relatively longer term, revolutionary transformations from an initial science-manifold of n principles, to successive new manifolds, of, successively, $n+1$, $n+2$, . . . , principles. There are two leading problems posed by this consideration.

The first of these two problems, is the science-driver principle itself. Each transition, from an n -fold, to an $n+1$ -fold manifold, requires cognitive action. In other words, the specifically anti-entropic intervention, by cognition, which is the unique origin of upward ordering of successive, anti-entropic transformations of scientific hypothesis. Without a high degree of agapic development among scientists and related strata, this ordering will not appear as desired.

The second of these two problems, is the society's attitude toward such scientific and technological progress. The questions include: How is this to be fostered? How are the benefits to be applied? What is the moral purpose toward which this effort is directed? What is the nature of the individual member of the human species, such that we are obliged to steer society's development and related practice in one certain direction, rather than another? In short, the set of implicit moral values distributed among members and strata of the population, will act, and with passion, to shape the direction of policy-decisions, according to the social values placed on alternative proposed answers to those questions.

In the case of the outstanding progress of western European civilization, from the Fifteenth-Century Golden Renaissance into much of the troubled Twentieth Century, the driving passion was that specific to western European Christianity: the emphasis upon struggling against the legacies of Babylon and of the evil Roman and Byzantine empires, and also against feudalism, to establish a form of society cohering with the notion that all persons, without racial or ethnic distinction permitted, are equally made in the image of God, that evidenced by the creative powers of cognition, awaiting development in each new-born personality.

The notion of society's obligation to develop those powers, and to rely upon them as the source of solutions for great problems, is the driving passion which engendered that European form of modern sovereign nation-state republic, best expressed by the Declaration of In-

dependence and Preamble of the Federal Constitution of the young United States, a U.S. whose peculiar advantages were, that it was an embodiment of the best ideas produced in Europe, such as those of Leibniz, in particular, but ideas expressed at a strategically less insecure position, relative to the long arms of those feudal relics known as the European landed aristocracy and financier oligarchy.

Thus, to forecast, one must concentrate on both the physical-economic aspect, with its immediate connections to matters of principles of physical science, but also the generationally oriented social-cultural processes. We have a significant, but secondary interest in the relatively more transient opinions as such, but a great deal of interest in what the London Tavistock Institute would prefer to identify as cultural "mind-set," or "cultural paradigm shifts:" the axiomatic hypotheses which tend to predetermine what opinions will be engendered, by the unfolding of a certain direction in combined, interacting, cultural and physical-economic developments over, usually, the span of a generation or two.

One can not master forecasting of this sort from an "ivory tower." In the absence of the existence of determinable, precise magnitudes of passion, associated with the set of any cultural paradigm, forecasting demands a high degree of intellectual participation in the process of studying patterns of shifts within populations, a study which must be grounded, inclusively, in an intense study of history from this vantage-point.

As a forecaster, my advantages have included, prominently, my critical view of the cultural quality of various strata among the populations of, most notably, North America and western Europe. This engagement, grounded in Classical philosophy, made it possible to foresee how institutions and populations would react to the very developments their own cultural impulses would prompt. A strong trend in culture will usually drive to some limit, at which it imposes a crisis upon itself; how it will respond to the crisis its choice of cultural impulse itself has thus caused, has been the usual record of history.

The first thing in successful long-range forecasting, is to recognize that the problem of forecasting as I have outlined it here, exists. Thus, to put aside the simplistic, usually reductionist, fallacy of composition, which has usually passed for economic forecasting methods in modern professional education and government.