

Special Report: Science and Infrastructure

by Lyndon H. LaRouche, Jr.

August 23, 2002

During the recent two years, the Americas, Europe, and most of the world at large, have come to the fag-end of a decades-long, popular delusion about economics. The present world monetary-financial system is already teetering at the brink of a collapse, a collapse which has been caused by nothing but that delusion. Now, during the Summer months of 2002, it has become clear, even to many among what had been the

world's stubbornly wishful dreamers, that the world at large is gripped by the terminal phase of economic collapse of the present world monetary-financial system, a collapse of the 1971-2002, International Monetary Fund (IMF) system. No recovery of that "floating exchange-rate" monetary-financial system, will ever occur, neither during the months ahead, nor over the years to follow.

What we are experiencing, is a form of global crisis far worse than that of 1929-1933. Nonetheless, it is a crisis which we could overcome. It must be conceded, that were we to do no more than repeat the measures of recovery used successfully by President Franklin Roosevelt et al., we would fail to meet the present challenge adequately. We must restore the Roosevelt reforms; but, to succeed, we must add new features, features made necessary by the great changes in political geography and physical economy over the course of the 1933-2002 interval as a whole.

The most urgent of the immediate, specifically physical-economic U.S. reforms required by this crisis, involves immediate adoption of policies for rebuilding the U.S.A.'s basic economic infrastructure. Sweeping measures for rebuilding the systems of power generation and distribution, water management, land reclamation, health-care, and education, must be fully under way during the 2003-2004 interval. There are two aspects of the United States' basic economic infrastructure which desperately require even more immediate attention, even prior to the November 2002 mid-term elections: *saving and rebuilding both the national railway system and the complementary air-transport system.*

I explain those needed immediate measures, first describing the crisis-setting, and the national mission-orientation in which such actions are to be understood.

What the U.S.A. is experiencing now, is the closing act

Table of Contents

Introduction: Hoover, Roosevelt, and George W. Bush	16
1.0 The Present National Crisis in Transportation	17
Was It a Conspiracy?	22
When Men Conspire	26
What Was LaRouche's Conspiracy?	28
1.1 Where Transportation Fits In.....	29
2.0 'Hard' and 'Soft' Infrastructure.....	32
Classical Humanist Education.....	33
Classical Artistic Composition.....	35
Health-Care As Infrastructure	37
3.0 A National Infrastructure Policy.....	38
U.S. Global Infrastructure Today	39
Our Space Program.....	42
3.1 The American System of Political Economy	45
3.2 Infrastructure and Profit.....	47



LaRouche's emergency infrastructure reconstruction program represents the methods of Alexander Hamilton's American System of political economy. "We must restore the Roosevelt reforms; but, to succeed, we must add new features, features made necessary by the great changes in political geography and physical economy over the course of the 1933-2002 interval as a whole."



of a Classical tragedy: a self-inflicted ruin. This is a ruin deeply embedded in the habits acquired, over several decades, habits acquired by our leading institutions, and tolerated by the overwhelming majority of the population in general. If, and only if, we, as a nation, can come to recognize the error in those presently widespread opinions and habits, we can find a way out of the crisis.

To escape from this crisis, we must abandon so-called "free trade" and "shareholder value" follies, to return to what our republic's first Treasury Secretary, Alexander Hamilton, outlined as an "American System of political-economy," a system entirely unlike the so-called capitalist and socialist systems of Europe. The great German-American economist Friedrich List named Hamilton's outline *The National System of Political-Economy*. It is a system sometimes identified as the "American historical exception": the system of such anti-Locke followers of Europe's Gottfried Leibniz as our Benjamin Franklin, Washington, Hamilton, Mathew and Henry Carey, Henry Clay, Abraham Lincoln, and avowed "American System" follower Franklin Roosevelt.

Solving the present crisis means warning every foolish American populist to stop blaming Washington, and "the politicians" for every actual or alleged suffering of our people,

from taxes to head lice; whereas, our more intelligent citizens rightly blame the menace of West Nile killer-virus on the silly popular opinion which allowed the fraudulent banning of DDT. No nation was ever threatened by destruction from within, except as a consequence of its prevalent popular opinion. In fact, the greatest source of present danger to the United States from our so-called politician class, is a prevalent whorish desire to be found attractive by what that class perceives to be popular opinion. So, we might speak, at times, of "Madam Government," and, often, of "Hollywood Madam Government."

We must accept the reality, that no recovery of the present financial system is possible, unless our minds be freed from the deadly, suicidal, "free trade" and "shareholder value" delusions of current popular opinion about economics. So freed, we were then able to act on the fact, that the hopelessly bankrupt, failed present system must be replaced by something like the successful 1945-1964 Bretton Woods system. Once that is accepted, a solution to the present crisis is possible. However, we can not simply wish for such a change; you must help me, now, to cause it to happen.

The kinds of monetary, financial, and economic reforms which we should remember as the experience of the 1933-

1945 Franklin Roosevelt recovery, are a model of the types of recovery measures which will work, once again, today. Now, as during 1944-1945 monetary deliberations, there are two general steps which can bring about a general recovery. First, a concert of nations must apply the methods of financial-bankruptcy reorganization, to replace the presently failed IMF system with a fixed-exchange-rate system. This must be a system modelled on the 1945-1964 period of post-World War II reconstruction. Second, those Franklin Roosevelt-like monetary and financial reforms, must be matched by new economic programs, programs of economic recovery installed as law by governments.

As was done under Franklin Roosevelt during the 1930s, some part of those economic measures, including some expanded infrastructure programs, should be introduced by the U.S. President and Congress right now, before the November 2002 mid-term elections, without waiting for the completion of the needed international monetary reforms. However, today, we can not postpone the new monetary system for more than a matter of months. The continued success of the immediate economic measures, will depend upon an early agreement to a 1945-1964 type of international monetary reform.

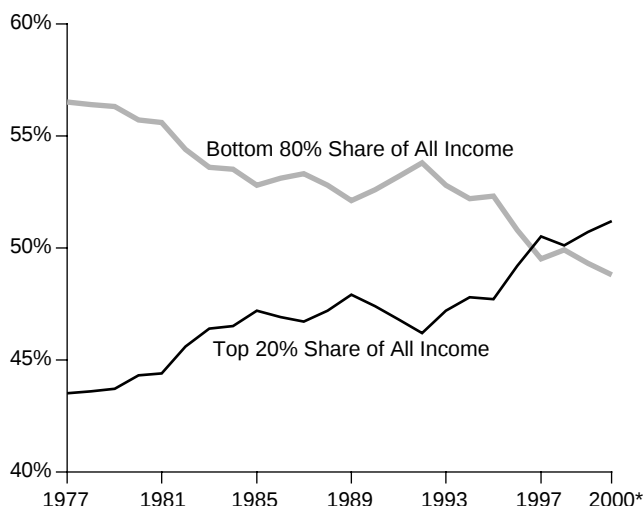
Hoover, Roosevelt and George W. Bush

Against the background of the present economic crisis, the use of the term “vacation” to describe President George W. Bush’s recent retirement to Texas, has an embarrassing double meaning. Instead of wasting precious time on vacation amusements, such as that propaganda side-show described as the Waco economic summit, President Bush should have pushed his administration and the Congress into two emergency measures to save the core of the nation’s public transport. He should have led actions to stop the virtual free fall of both the presently disintegrating national railway system, and the gravely endangered commercial passenger-airlines system. Were there no immediate action to protect these systems, action along the lines of the Franklin Roosevelt precedent, to save and rebuild those two imperilled elements of our nationwide transport system, the U.S. economy would soon cease to exist as a viable form of national economy. If we let those rail and air-traffic systems collapse now, it would take years to rebuild up to even the level of those systems today. The danger of such disintegration is an immediate national, economic-security emergency.

I repeat my warning: Were we, now, to allow a further round of that shutdown of our nation’s public transport, power, and water-management systems, a shutdown which began under the direction of President Jimmy Carter’s National Security Advisor Zbigniew Brzezinski, the United States would cease to have a national economy in fact. Since Brzezinski came into that position of power, in 1977, there has been a persistent, accelerating decline in the real (physical) standard of living of Americans in the lower 80% of family-income brackets (**Figure 1**). Recently, with the 2000-2002 collapse of the so-called “new economy,” the lower half of the

FIGURE 1

Top 20% of Population Have More Than Half of All After-Tax Income



* = projected

Sources: Congressional Budget Office; EIR

upper 20% of family-income brackets has been increasingly hard hit with loss of financial assets. That collapse is now about to become much, much worse, unless drastic and sudden changes in national policy and practice are introduced now.

With the looming collapse of Federal Reserve Chairman Alan Greenspan’s mortgage-inflation bubble, areas of apparent real-estate booms, such as the greater Washington, D.C. area, are threatened with giant waves of foreclosures, and catastrophically deep collapse in nominal value of the mortgages which had been bundled for processing by Fannie Mae and Freddie Mac. Meanwhile, the international valuation of the U.S. dollar had been propped-up by foreigners’ subsidy of the mushrooming U.S. current account deficit, and floods of flows of money, from sources including the OPEC states, as subsidies of the U.S. financial system. Those subsidies are now drying out, as President Bush’s support for Prime Minister Sharon’s Middle East war, and Bush’s pushing for a war against Iraq, is accelerating flight out of the U.S. monetary and financial systems.

As long as the present system persists, no general form of economic recovery will ever occur. The so-called economic fundamentals are hopelessly unsound.

Our nation’s situation is broadly comparable to, but far more menacing than that under President Herbert Hoover, during 1929-1933. Hoover did not cause the Great Depression of the 1930s, but he refused to reverse the accumulation of policies which had been introduced under Presidents Theodore Roosevelt, Woodrow Wilson, and, especially, Calvin Coolidge. These foolish policies were the accumulated

changes, such as the Federal Reserve Act, which, combined with the world-wide reign of the British Nineteenth-Century gold standard, had dominated the 1901-1929 trends in the U.S. and world economy. These were the policies which had ultimately produced the two depressions in the 1922-1933 U.S. economy. It was this trend, continued under Wall Street's Andrew Mellon, which was the primary cause for the 1929-1933 crash.

Now, like Hoover before him, President George W. Bush, "Number 43," has been induced to make some terribly bad decisions. Worst, has been the lie spread by that Administration and also some leading Democrats, that "the fundamentals are sound" and a "recovery on the way." In fact, the U.S. situation today is, as I said, far more dangerous than that of 1933. The first step toward overcoming an economic depression, is to cease denying the fact of the onrushing collapse. There is no recovery, George; Dracula will not be flying to-night, or any night.

Contrary to rumors, Hoover's reelection was not ruined by the Depression; he was ruined by refusing, as Number 43 has done so far, to admit that a genuine depression was in progress. Like Hoover before him, Number 43 did not cause the present U.S. depression; but, like Hoover, he adopted it as his child. That mistake is what ruined Hoover's hopes of reelection. Hoover was not to be blamed for the Depression; he was justly blamed by Franklin Roosevelt for allowing it to become worse. The same blunder would doom Number 43, and most of our citizens, too, unless the President were turned around, to adopt a new set of advisors who might persuade him not to repeat President Hoover's politically fatal blunder.

I repeat a crucial fact. The chief difference between 1929-1933 and today, is that today's crisis, while similar to the Great Depression of the 1930s, is far more serious. Nonetheless, the same principles which Franklin Roosevelt used to save the U.S. then, are key sources of insights, for defining the cure of the epidemic of accelerating collapse presently under way.

1.0. The Present National Crisis in Transportation

Compare the portions of the U.S. national railway system which are in service today, with the system in service prior to 1977 (**Figure 2**), and also look back to an earlier time, prior to the late 1950s merger negotiations between the Pennsylvania and New York Central railways (**Figure 3**).

Now, referring to the 1977 map, ask: Which intercity rail routes would be more efficient ways of transporting passengers than passenger air-transport? In making the comparison, assume that modernized rail systems, comparable to France's high-speed intercity system, or the German design for a magnetic-levitation (maglev) system were used.

For example, look at the Northeast corridor from Boston,

Massachusetts, down to Washington, D.C. (**Figure 4**). Start from the South Station in Boston, and proceed through Pennsylvania Stations in Manhattan and Philadelphia, through Baltimore, and Washington, D.C. Starting from downtown Boston, through downtown Manhattan, Philadelphia, Baltimore, to Washington, compare the in-travel time of passengers by rail, with the lapsed time required for travel from the city center to the airport, processing to board the aircraft, and so on, to reach a downtown destination in each of the cities en route.

Now, compare the incurred costs to airlines, of maintaining intercity passenger service, with the total incurred costs and lapsed time for travel by modern rail or maglev (e.g., persons, man-hours, miles, lapsed time of movement, dollars of capital plus cost. Lapsed time of movement is calculated as average time, beginning with travel to mode of rail, or air transport, to reaching the ultimate destination for which the rail or air portion of travel is chosen.) (See **Table 1** on p. 24.)

Now, continuing to focus on the Northeast rail corridor as a point for comparisons, consider the unpleasant reality, that domestic airlines now in a state of actual or near-bankruptcy, are slashing intercity passenger service as a way of effecting needed economies. Now, consider the action of the Bush Administration, the Congress, and others, in continuing to destroy even the presently remaining national rail service.

Now, compare the total cost to the national economy of moving passengers by highways, rather than rail types of intercity and local mass transit. Include all of the costs which society incurs by substituting highway transport for rail-type mass transit, including bigger highways, traffic jams, and so on. That far, we have only sampled some of the most direct costs of the changes in work- and life-style for both the population in general, and the national economy.

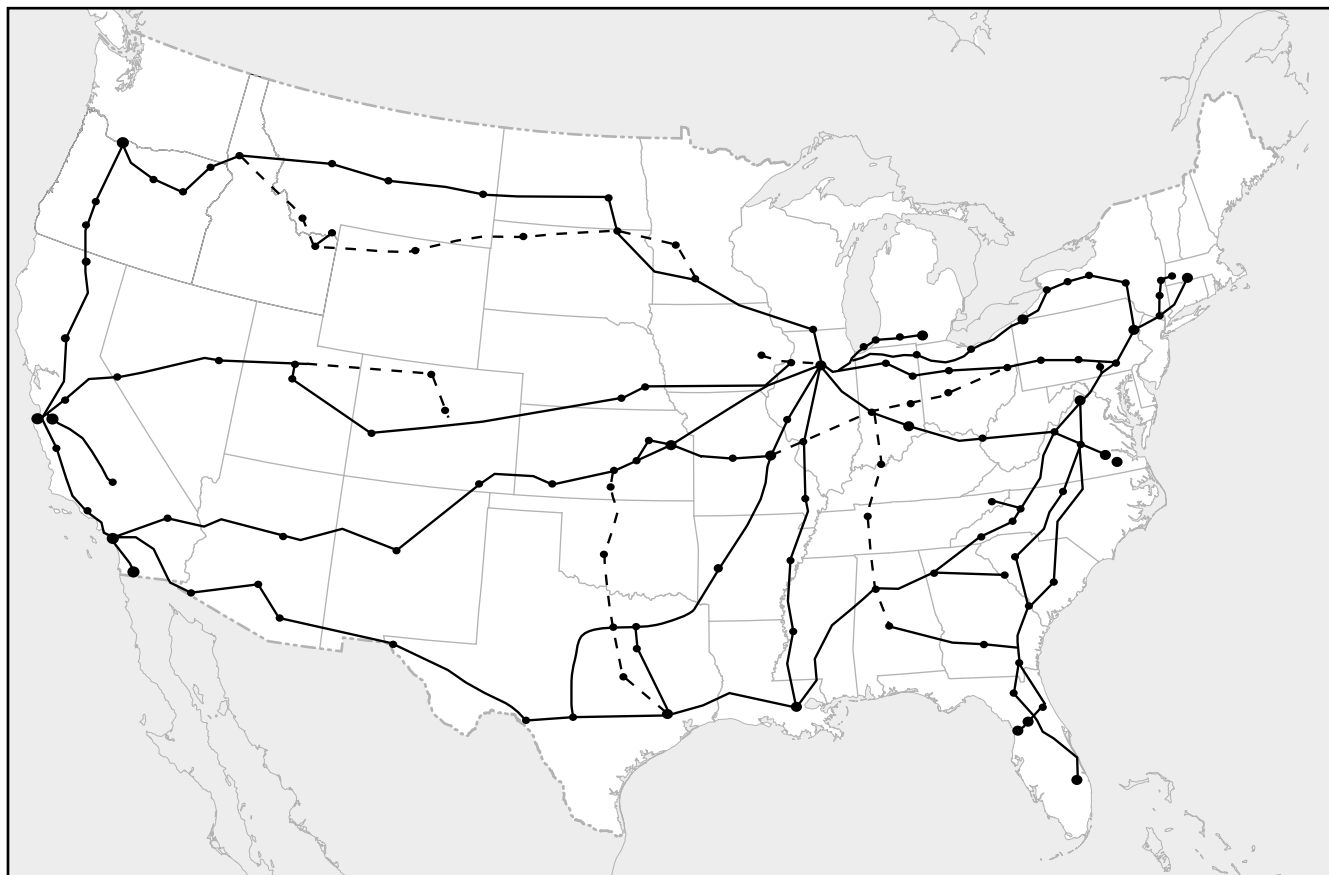
Now, shift attention to a related matter. This time, study the 1977-1980/2000 changes in economic relations among intercity and national rail corridors, on the one side, with collapsing levels of industrial activity in population centers, and with the amounts of passenger travel and freight-tonnage along lines connecting these urban centers. Compare these changes with 1971-2000 changes in the percentiles of the total labor force employed as operatives, engineers, and technicians, in capital-intensive forms of manufacturing and farming (**Figure 5**). Compare these U.S. data to the case for the agro-industrial economy of Germany over the interval 1971-1989 (**Figure 6**). We have reduced the percentile of the labor force employed in production of physical goods, while increasing the percentile employed in such forms of overheard costs as unessential low-skilled services and administrative routines: no way to run a railroad!

Ask: What is the meaning of those changes to which these selected statistical benchmarks point?

Beginning approximately the time coinciding with the U.S. entry into its official 1965-1972 war in Indo-China, the U.S. economy underwent a profound change. It turned away from its tradition as the world's leading agro-industrial na-

FIGURE 2

Amtrak Rail Lines Lost Since 1971



Source: EIRNS.

Since its creation in 1971, Amtrak has eliminated passenger service on thousands of rail miles, while opening up service on just two routes. There has been a significant overall contraction in America's passenger rail service. Moreover, there was already at least one-third less passenger rail mileage in 1971 than in 1945. Here, hatched lines designate eliminated corridors; heavy lines are those remaining.

tion, to become an increasingly decadent culture, to become what has been called a "post-industrial," or "consumer" society. I have compared this 1965-2002 plunge into economic and cultural decadence, to the degeneration of ancient Italy which characterized Roman civilization and its tradition, from approximately the close of the Second Punic War, until the emergence of modern European civilization during the Florence-centered Fifteenth Century Renaissance of the anti-Romantic, Classical Greek tradition.

Those powerful political-financial forces which had hated President Franklin Roosevelt, seized the opportunity presented by his untimely death, to begin tearing up the foundations of those American constitutional traditions which Roosevelt had invoked to rebuild the U.S.A. as the only world power to emerge from the 1939-1945 war in Europe.

During 1933-1945, Roosevelt rebuilt the power and prosperity of the U.S.A. through his reliance on that principle of

the general welfare which is known as *agape* in the Classical Greek of Plato and of the Christian Apostles John and Paul; rebuilt the ruined nation he inherited from President Hoover's failing fingers. His opponents preferred the contrary tradition of Presidents van Buren, Polk, Cleveland, Theodore Roosevelt, Woodrow Wilson, and Coolidge. Once the war had been surely won, those opponents used the occasion of the President's death, to begin the process of uprooting the constitutional foundations of that Roosevelt-led, capital-intensive economic reconstruction of the nation's physical productive powers, which had been built up during the 1933-45 interval.

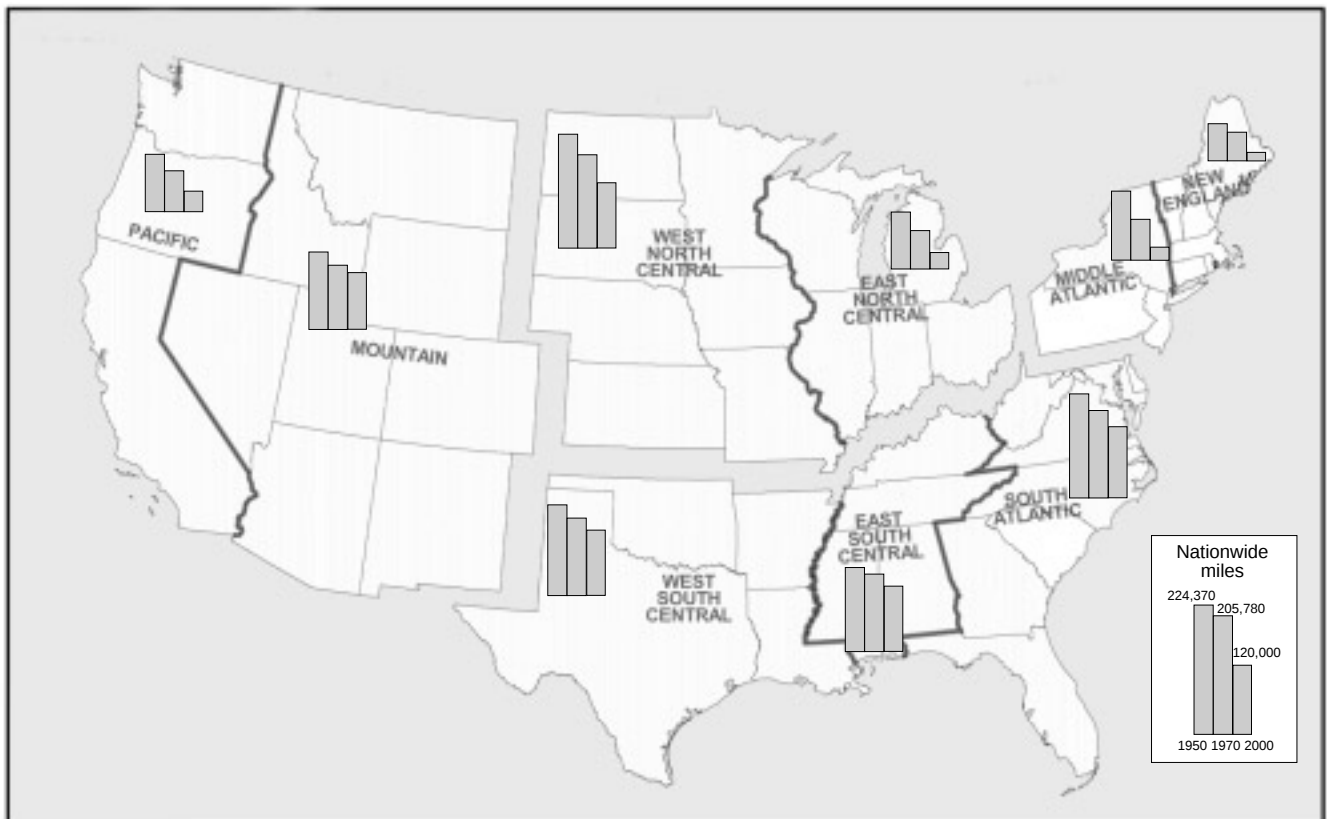
Nixon's 1971 Decision Undid FDR's Work

The primary target of this Roosevelt-hating, so-called "conservative" financier-led interest, was the popular base of Roosevelt's leadership. The objective was to begin the process of ripping the general welfare clause out of the U.S.

FIGURE 3A

Decline in Railroad-Track Mileage, 1950, 1970 and 2000, By Region

(Miles of Track)



Source: U.S. Dept. of Transportation.

This and following maps show total U.S. Class I track miles owned—a figure which counts multiple main tracks, railyard tracks, and sidings. America has lost 77,400 miles, or 35%, of the Class I track it had in 1970. The national and regional bar graphs show the steep reduction in rail miles—despite an 80 million population increase in the country—which has reduced economic productivity. (Note the different scales of regional and national graphs.)

Constitution, and gradually degrading and corrupting those portions of the population which had elected Roosevelt to an unprecedented four terms as President.

Until President Eisenhower's retirement from office, and the assassination of President Kennedy, the Roosevelt legacy was still so deeply embedded in the U.S. population, that the enemies of that legacy, the nuclear-utopian cabal, were limited to corrosive, but inconclusive victories in their determination to turn back the clock to Teddy Roosevelt, Wilson, and Coolidge. The case of the Suez Crisis illustrates that point. The assassination of President Kennedy and the launching of the official U.S. war in Indo-China, signalled the takeover of U.S. political and economic policy-shaping by a force which Eisenhower had denounced as "the military-industrial complex." That "complex" is what is otherwise known as the utopian financier/war-making interest, as presently typified by its sympathies for Israel's Ariel Sharon and the political

"chickenhawks" foolish lust for a new war against Iraq.¹

Under the growing influence of those wild-eyed utopians, who used their roles as caricatures of Roman imperial pro-consuls, to control both the Nixon and Carter Presidencies, the United States underwent a fundamental change in outlook echoing the imperial impulse of post-Second Punic War Rome. Imperial Rome ceased to be a productive economy, and, instead, relied increasingly on looting those populations which it subjugated both within its empire, and on the Empire's borders. The crucial blow which brought about the transformation of the U.S. from a productive, to a degenerate, consumer society, was the launching of the anti-Franklin Roosevelt decision of August 15, 1971. That decision destroyed

1. The term "chickenhawks" is currently used to point out the lack of U.S. military service records among those fanatics currently most zealous in their reckless demands a more or less immediate war against Iraq.

FIGURE 3b

East North Central Region: Abandoned and Existing Rail



John Sigerson / EIRNS 2002

In the East North Central region—Ohio, Indiana, Michigan, Illinois, and Wisconsin—one-third of the Class I rail trackage of 1970 had been shut down by 2000. The map shows abandonment of lines to such cities as Chicago and Springfield, Indianapolis, Toledo, and St. Louis, Missouri on the Illinois border. Rail ferries between northern Michigan and Wisconsin cities are also gone. The rail abandonment starkly reflects the manufacturing collapse of this vital industrial region.

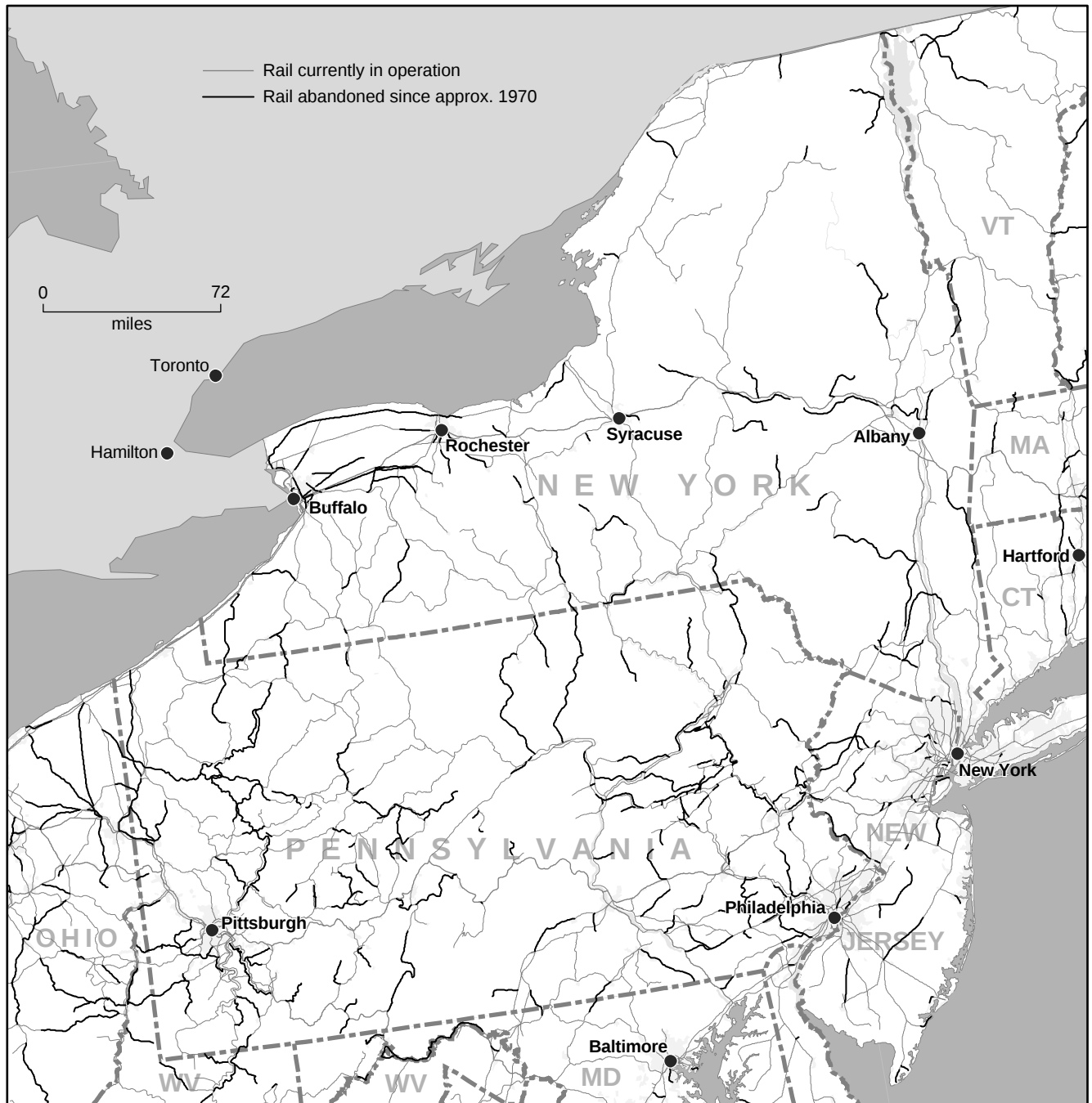
that Roosevelt-designed Bretton Woods system which had organized the great post-war economic build-up of 1945-1964. President Nixon launched the so-called “floating ex-

change-rate” system which led into the presently onrushing collapse of the post-1971, global monetary-financial system.

The collapse of many of the former industrial centers of

FIGURE 3c

Middle Atlantic Region: Abandoned and Existing Rail



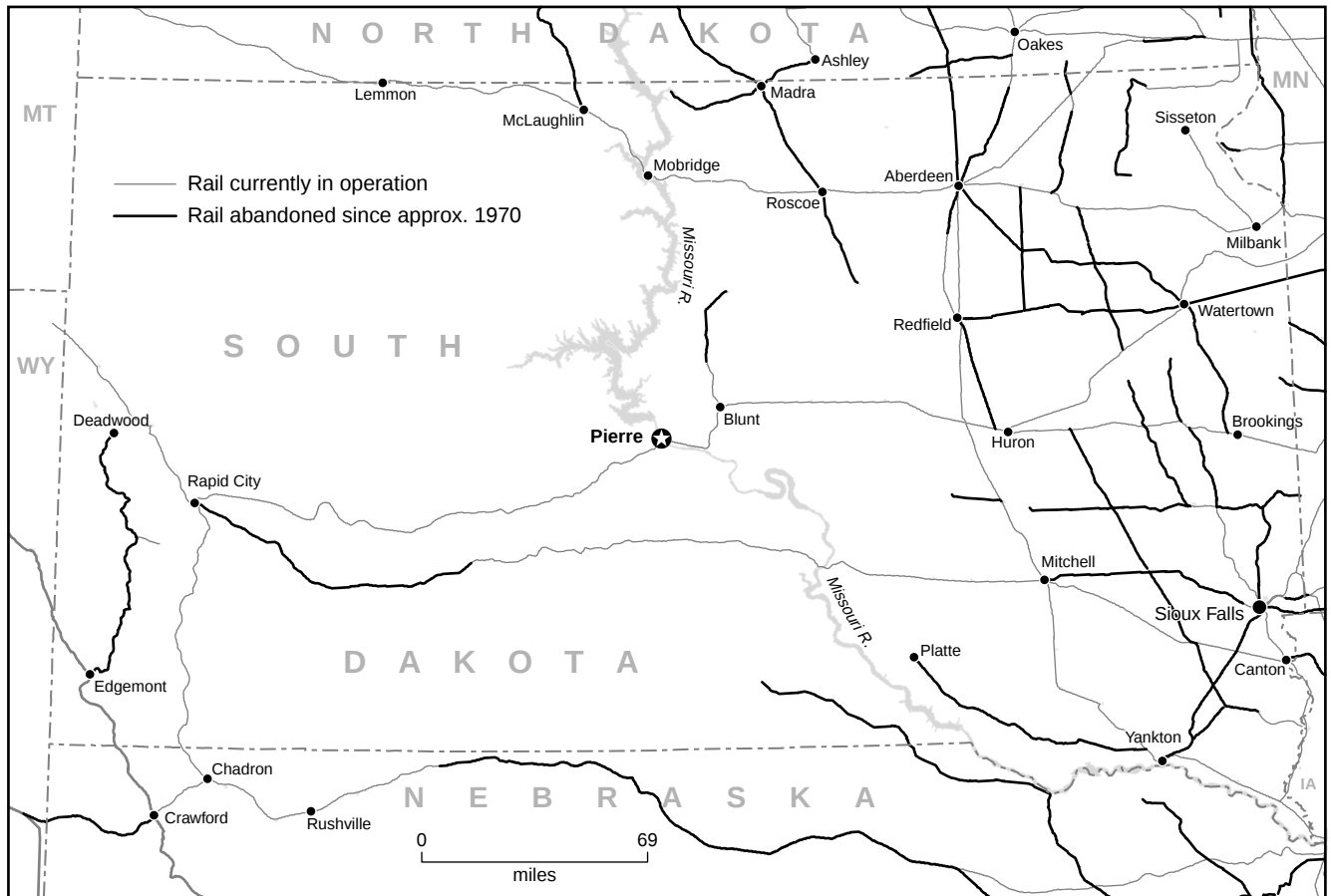
The Middle Atlantic region of Pennsylvania, New York, and New Jersey: Pennsylvania, the historic cradle of America's rail development, has seen extensive parts of its rail system abandoned.

the U.S.A., the collapse of the technologically progressive family-farm system, and the collapse of the U.S. rail system, are leading markers of a decadent United States driven now, like the fabled lemmings, to the waiting brink of the cliff.

From the time of the 1944 Democratic primary campaign, until the present, the utopian financier circles of the U.S.A. and the far-flung British Empire, were obsessed with the idea of building a post-war, English-speaking world empire, a uto-

FIGURE 3d

South Dakota: Abandoned and Existing Rail



John Sigerson / EIRNS 2002

South Dakota represents many farm states: More than half of the rail grid in the eastern half of South Dakota, connecting it to the East, has been abandoned.

pians' empire modelled on the widely publicized "Open Conspiracy" design presented jointly by the utopian nuclear-weapons fanatics H.G. Wells and Bertrand Russell and their followers.

Was It A 'Conspiracy'?

At that point in this report, one can hear today's wild-eyed maenads and satyrs shrieking their protesting cries of "Conspiracy theory!"

Fools like those, when met among academics, are easily recognized as victims of those types of wild superstitions met among such followers of the Cathar cult as the empiricists John Locke, Bernard Mandeville, François Quesnay, David Hume, Jonathan Edwards, Adam Smith, and Jeremy Bentham. These cultists worship a god of the gamblers, whose "Invisible Hand" operates from under the floorboards of the universe, fixing the roll of the dice, so that some men, preferred by that "Maxwell demon," become rich, and others

poor. For such superstitious fellows, history is shaped by statistical accidents beyond the comprehension of the human will. For them, religion is a form of worship of an all-powerful, demonic croupier allegedly lurking under the floorboards of reality.

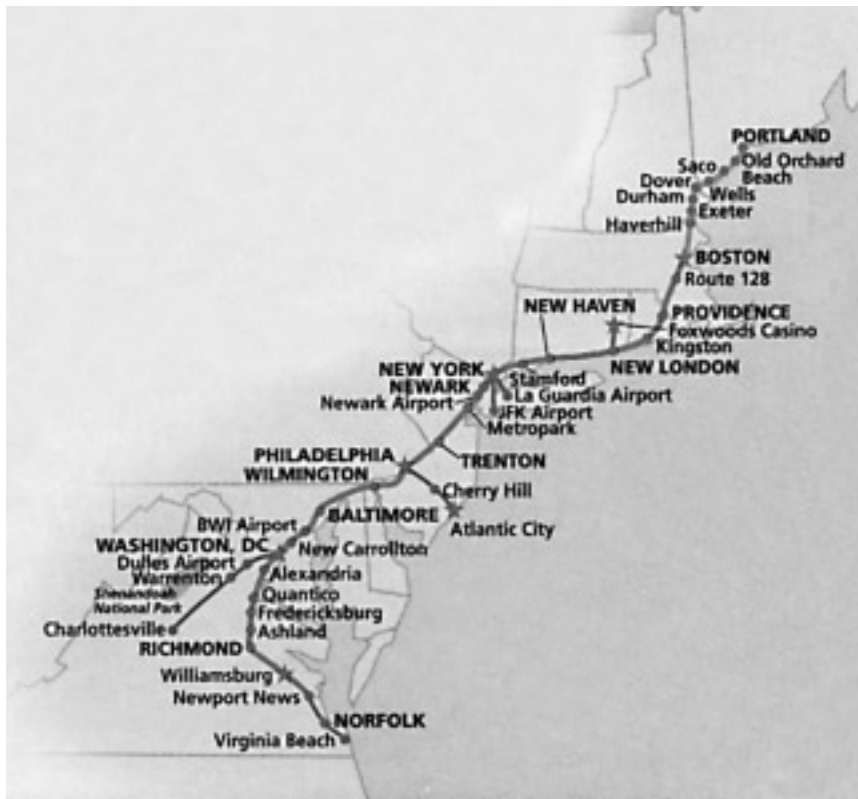
If one points out the existence of such rules of behavior promoted by those influential peddlers of superstition, worshippers of that demonic "Invisible Hand" may burst into mindless, repeated chanting of "Conspiracy theory!"

Contrary to such superstitious fellows, history is actually shaped in the way the German Classical military doctrine of *Auftragstaktik* implies. I explain.

History is shaped as Johannes Kepler, the original discoverer of gravitation, and first founder of a comprehensive form of modern mathematical physics, defined the organization of the Solar System. God, says Kepler, governs the lawfully ordered orbit of the planet by an *intention*, an intention which Kepler identifies as a *knowable universal physical principle*,

FIGURE 4

The Amtrak Northeast Corridor



Source: Amtrak.

the principle of gravitation. God is no gambler's bookmaker, no statistician. He is a God of truth, not mere opinion; He is a God of universal physical principles, principles which, as Kepler shows, express His *intention*.

In society in general, as in government itself, government can, at best, choose a course of national action based upon proven universal principles. However, that knowledge of principles is not perfect forewarning of what will actually occur. We poor mortals never know *all* of the principles which are operating; therefore, the field commander, or corporal will probably find that the combat or analogous situation he faces, is not exactly the situation which he, or his superiors expected. His challenge, therefore, is to discover how to fulfill the specific mission to which he is assigned, by using his professional skills and powers of creative leadership, to develop the needed tactic on which successful leadership in the mission depends. In the extreme case, as "old" Moltke illustrated the principle for a specific case, the local assigned task may even be cancelled and replaced, on the judgment of the trusted local commander. In German: *Auftragstaktik*.

Therefore, success of the mission often depends on what

is best termed "flanking" the opposition. Often, this means recognizing an exploitable flaw in the opponent's tactical expression of his intention. Since the definition of the principles of *strategic defense* by France's great engineering officer Lazare Carnot, superior skill in development and use of logistics, rather than kill-power, is a crucial margin of difference in warfare, or comparable mission-oriented enterprises. The example of Gen. Douglas MacArthur's direction of the Pacific War, is an example of the preeminent role which strategic defense assigns to logistics.

It is the same in all important missions in life.

In peace, or war, the laws and customs of a society combine in their effect, to form what scientists term a *system*, as a specific form of mathematical physics is a system. By "a system," we should understand something comparable to Euclid's geometry, his *Thirteen Books of the Elements*. The system is based upon an approximately fixed set of definitions, axioms, and postulates. That system is filled out by adding an accumulation of theorems and related impedimenta, each and all of which are presumed to be not-inconsistent with the set of definitions, axioms, and postulates. A body of popular opinion, for example,

has many of the characteristic features of such a system. For example, the culture of Belshazzar's Babylon was such a system, in approximation. The notion of such a system is the point of Percy Shelley's poem "Ozymandias."

The point to be emphasized, is that virtually all such systems encountered in scientific practice, or the prevalent practice of a society, are flawed. Most social systems known from history have been exposed as tragically flawed. The rational study and criticism of such mathematical and social systems, is the branch of science known as *epistemology*. A body of religious belief is such a system. The doctrine of Karl Marx's four-volume *Das Kapital*, represents such a system. Any current body of popular opinion has the qualities of such a system.

For example, when a fanatical adherent of the system known as empiricism or logical positivism, screams "Conspiracy theory!" he is denying the fact that empiricism is a system. That means the empiricism common to such as Sir Francis Bacon, Thomas Hobbes, Lord Shaftesbury's John Locke, Bernard Mandeville, David Hume, Adam Smith, Jeremy Bentham, and their imitators. The respective, competing,

Rail Is Faster in Northeast Corridor

Travel by rail is at least as fast or faster than air travel, in trips between most cities 350 miles (564 kilometers) apart or less. As magnetic levitation is built, it becomes the best mode of transport by far.

Table 1 shows lapsed times of travel, downtown to downtown, from Boston to the leading cities in the Northeast Corridor. Since the Amtrak stations in these cities are located in the downtown areas, they are easily accessible from the city proper as a starting point for travel; whereas reaching an airport requires travel from downtown, usually involving several different vehicles.

The trip from Boston to Baltimore exemplifies the process. Start in downtown Boston and take the Blue Line subway to Logan Airport Station, and then the Massport Shuttle bus to the airline terminal (total transit/ride time for the two vehicles, including a short wait, is 40 minutes). A commuter must now arrive 2 hours before plane departure. The flight to Baltimore will take 1 hour, 28 minutes, and deplaning, another 15 minutes. Then the commuter must take the shuttle bus to the MARC train station, and the MARC train to downtown Baltimore (total transit/ride time for these two vehicles, including average waiting, 1 hour and 15 minutes). From departure in downtown Boston, the traveller arrives at downtown Baltimore 5 and 45 minutes later—assuming no baggage is checked.

Compare train travel, and then the more revolutionary magnetic levitation (maglev) train. In each instance, the

point of departure is downtown Boston's South Street station, proceeding to New York's Penn Station, etc. From Boston to New York, Amtrak's normal train service is an hour faster than the airline trip; its higher-speed Acela Express train is an hour and a half faster, although the poor condition of Amtrak's tracks holds the Acela below its top cruising speed. The Acela Express also beats plane travel to Philadelphia, and is comparable in the case of Baltimore.

It may appear anomalous that a trip by air takes less time from Boston to Washington, D.C., than it does from Boston to New York City, only half the distance. It is ground transport to and from the airport that consumes much of the time in the trip to downtown New York City, whereas Washington's Reagan Airport is a short subway stop from downtown. Thus, the Boston to Washington trip is the only one, in which the lapsed time of travel is appreciably less by air than by rail.

But once the United States develops maglev rail, as LaRouche recommends, the situation changes dramatically. Maglev cuts the transport time by 60-85%, depending on the destination. In a maglev system, there is no steel wheel riding upon steel rail; rather, magnetic forces lift, propel, and guide a vehicle over, or under a guideway, so that it "floats" on a magnetic cushion. This eliminates the major source of friction, vibration, and wear on the vehicle, which slows all traditional modes of railroad transport. Maglev systems permit revolutionary methods of locomotion and control of the moving vehicles. Current generation maglev systems travel, in extensive tests, at top speeds of 280-300 mph (450-492 kmh). At that point, air travel becomes appropriate only for distances greater than 500-750 miles (805-1207 km).

—Richard Freeman and Anita Gallagher

TABLE 1

Northeast Corridor: Travel from Downtown Boston

(Hours in Transit, by Mode)

	Distance from Boston	Airline, No Baggage	Airline, Baggage Checked	Normal Amtrak	Amtrak Acela Express	Maglev Train
New York	208 miles (335 km)	5.50	6.00	4.25	3.65	0.90
Philadelphia	299 miles (481 km)	5.25	5.75	6.00	5.15	1.30
Baltimore	404 miles (650 km)	5.75	6.25	7.50	6.35	1.90
Washington, D.C.	434 miles (699 km)	5.00	5.50	8.10	6.90	2.00

Source: Amtrak; Airport Services; EIR.

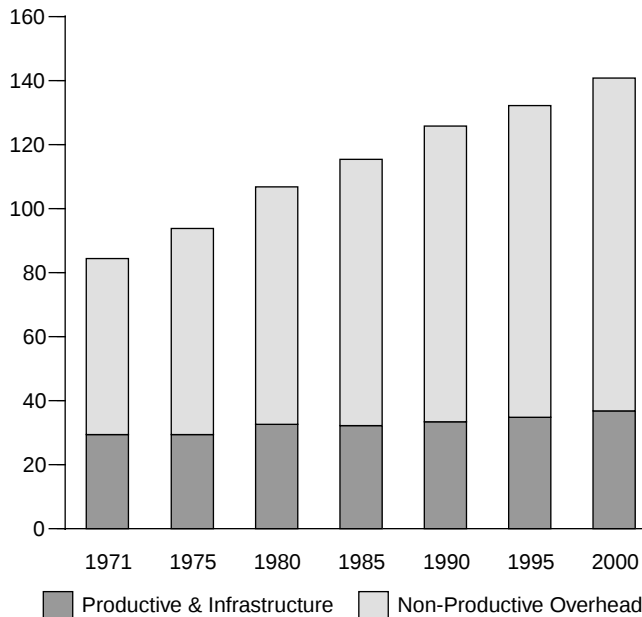
neo-Aristotelean outgrowths of the modified empiricist systems constructed by Immanuel Kant, G.W.F. Hegel, and Hegel's crony Savigny, and other post-1789 Romantics, are spe-

cific types of systems which are not only distinct sub-types of empiricist systems, but they can not be understood in a practical way, unless they are recognized as systemic outcroppings

FIGURE 5

U.S. Labor Force, 1971-2000: Non-Productive Overhead Grows

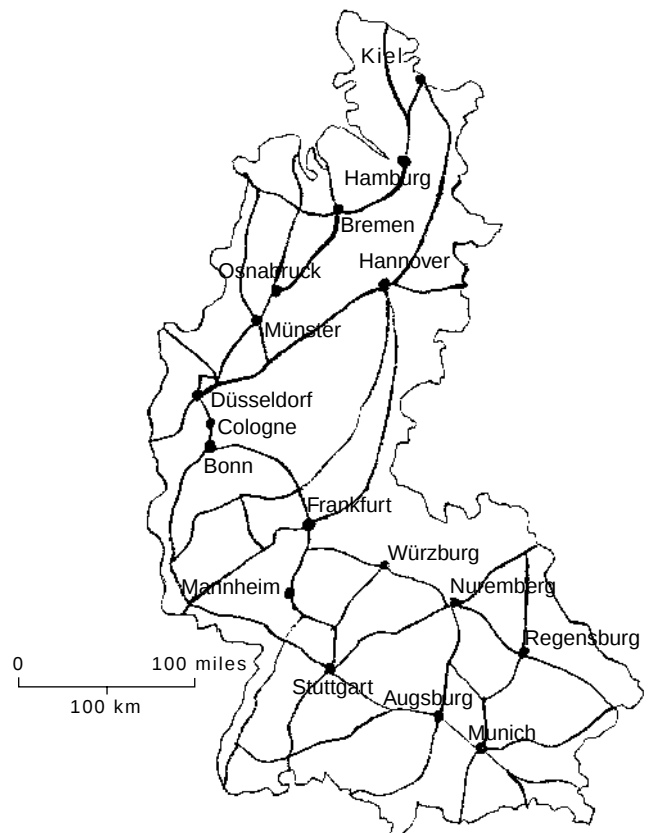
(Millions of workers)



Source: U.S. Dept. of Labor, Bureau of Labor Statistics, "Employment & Earnings"; U.S. Department of Commerce, "Statistical Abstract;" U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professionals; U.S. National Center for Health Statistics; *EIR*.

FIGURE 6

West Germany 1989: Selected Routes of Rail Grid



of both anti-Classical Romanticism in general, and empiricism in particular.

For example, the current form of combined economic and social philosophy of practice of the present United States, is a system. It is a system which has connections to the earlier systemic features of U.S. mass behavior, but which is functionally distinct from the dominant systemic features of pre-1965 mass behavior of the U.S. The change of the United States from its earlier character as a producer society, to its recent decadence as a consumer society, is typical.

For example, most among those Americans who passed through adolescence during the 1960s, often seem almost a different species than their parents' and grandparents' generations, chiefly because of the cultural paradigm-shift characteristic of the mid-1960s shift from a producer-oriented system toward a consumer-society system. There is an even more pronounced cleavage between the systemic outlook of the "Baby Boomers" and their children's generation.

It is such systemic cultural features of cultures, and such systemic differences among successive generations of the same culture, which are crucial in attempting to make any important forecast of the likely developments within a society as a whole, or a definable stratum of that society. My un-

equalled success as a published long-range economic forecaster, is due chiefly to my emphasis of the overlay among two kinds of systems: The system represented by physical science, and systemic features of the differentiated social-cultural systems of which a society is composed.

Whether in Classical tragedy, or current history, the crucial features of long-ranging social processes, are most clearly expressed by the effects of the breakdown of what had been previously well-established social-political systems. In such latter cases, the society's habitual adherence to customary rules of behavior has led, ultimately, to a loss of that system's superficially apparent, temporary appropriateness to the situation now confronting it. "The system doesn't work any longer as it was supposed to!" So, a generation or more after the rise of the ideology's influence, perhaps longer, reality has overtaken the system, exposing the fatal flaw embedded within it from the beginning.

The farcical "economic conference" recently performed at Waco, is an exemplary symptom of such a breakdown at the end-phase of a previously habituated system of mass behavior. President Herbert Hoover's pitiable folly, in his

response to the 1929-1933 crisis, is an example of the way in which what had been considered reliable beliefs, turn cruelly against the believers. Such are the evidences of what is accurately identified as a *systemic crisis*.

The following little example is noteworthy.

The occurrence of what had been the inevitable collapse of Enron, has triggered a hue and cry against alleged “bad apples” among prominent executives of corporate basketry. Foolish people now cry: “Weed out the bad apples, and all will be well once again!” In fact, the badness of those apples, the inherent moral corruption of those apples, is an inevitable product of the system launched by Federal Reserve Chairman Paul Volcker in the fourth quarter of 1979, a system continued by Volcker and Alan Greenspan ever since: the so-called “shareholder value” system. To clean up that system would require nullifying all of those relevant legislation and Federal court decisions since 1982, which favored the practices of Ivan Boesky, Michael Milken, the Keating Five, and George Soros. The rotten-apple system features the role and influence of the Democratic Leadership Council (DLC), deregulation, “privatization,” and so on, which went into building such edifices as the financial architecture and corporate practices of Enron, the dot.com bubble, and the Fannie Mae-led mortgage bubble. The problem is not the apples; the source of the rot in those apples is the tree. The rot is the decadence built in, axiomatically, to the consumer society as a species of political-economic system and legal philosophy.

When Men Conspire

The scrupulous epistemologist warns, that the uses of the term “conspiracy” have one meaning in common, but also three meanings which are explicitly contrary to one another.

Each of these uses of the term, signifies a sharing of intention among some, or even nearly all of the members of a society. In the term’s common use, it signifies a plot, a scheme, to some purpose which is held secret from persons outside that particular association. In the more significant use of the term, it points toward a sharing of belief in a set of assumptions which have the implied character of a special set of definitions, axioms, and postulates. In the latter case, we may speak of “shared belief in a system.” *We speak of systemic, rather than ad hoc conspiracies.*

All of the important features of the present U.S. economic

and monetary-financial crises, are reflections of the effects of widespread sharing of what are chiefly the misguided beliefs (*vox populi*) of a large population. The center of the systemic conflict so defined within today’s U.S.A., is the often embittered opposition between those who believe in the regulated, production-oriented American System of political-economy of President Franklin Roosevelt, and the opponents of that system, who prefer the decadent, consumerism-oriented system of deregulation and “free trade” currently preferred among anti-Roosevelt, American Tory ideologues. It is the latter system whose axiom-driven failure has prepared the way for, and unleashed the present world depression.

Today’s relevant, *systemic conspiracies* are assorted among three outstanding types.

The first two types, represent, respectively, *ad hoc* or systemic forms of belief in a fixed system, the latter like that of both Aristotle and the empiricists; the definitions, axioms, and postulates of the system remain permanently constant within the limits of that specific system. The third type, expresses the Classical conception of man in the universe as typified by Plato, Kepler, Leibniz, Gauss, and Riemann. This latter view *rejects axiomatically* that notion of a fixed set of so-called “ivory tower” axioms, which we associate with Aristotle, Claudius Ptolemy, and empiricists such as Galileo, Descartes, Bertrand Russell, et al.

The third view is typified by the discoveries of mathematical physicist Bernhard Riemann, as Albert Einstein came around to accept, explicitly, that view—of a finite but unbounded universe—which had been defined by the discoveries of Kepler and Riemann. This third view is that which I have shared, with increasing efficiency, since adolescent wrestling with the leading Seventeenth- and Eighteenth-Century English, French, and German philosophers, including Leibniz and Kant. My choice is the view which corresponds in practice to what Alexander Hamilton defined as *the American System of political-economy*. This third view, explicitly that of Leibniz, locates the source of profit of national economies as a whole in the development of *the physical productive powers of labor*, a development originating in the discovery and application of *new universal physical principles*.

That American System has its explicit origins in two crucial aspects of Leibniz’s discoveries in political-economy. First, Leibniz’s founding and initial elaboration of that branch of physical science known as *physical economy*, over the interval 1671-1716. Second, as the U.S. 1776 Declaration of Independence attests, Leibniz’s definition of “Life, Liberty, and the Pursuit of Happiness,” in his exposure of the fraud of John Locke’s Cathar-like, pro-slavery definition of “Life, Liberty, and Property.”

In the third view, the only source of actual profit of an economy as a whole, is the application of discovered universal physical principles to the effect of creating new states of nature, states of nature which could not have existed prior to making those discoveries of what are provably universal

WEEKLY INTERNET
AUDIO TALK SHOW

The LaRouche Show

EVERY SATURDAY

3:00-4:00 p.m. Eastern Time

<http://www.larouchepub.com/radio>

physical principles. *The proof must be physical, not mathematical.*² The typical effect of such policies of science-driven practice, is to increase what I have defined as *the potential relative population-density of society*, as measurable per capita and per square kilometer of the Earth's surface.

Three Characteristics of the American System

The meaning of the term "ideas," as defined by Plato and his followers, is restricted to the implications of such a definition. Such discoveries of principle (ideas) are of two forms. First, the discovery of ideas concerning nature, as by an individual discoverer of a principle of abiotic physics or of biology. Second, discoveries of social principles bearing upon mankind's increased power to acquire, and cooperate in realization of such ideas. The latter ideas, respecting the intellectual organization of social relations, have distinct physical effects. *Therefore, such ideas respecting the social organization of mankind around ideas, also qualify efficiently as universal physical principles, in the same sense as any other experimentally validated discovery of a universal physical principle.*³

Therefore, the ability of society to generate a true profit, depends absolutely on the discovery and application of man's discovery of both classes of new universal physical principles, as I have included among physical principles, certain types of ideas respecting social organization. With that important qualification, we might say that the only source of sustainable true profit of a society, is the quality of scientific and technological progress driven by an ongoing process of an individual's voluntaristic discovery and application of an expanded store of such combined types of universal physical principles.

Thus, we should rightly regard the influence of the doctrines of the neo-manichean Cathars, as echoed by Locke, Quesnay, Mandeville, Adam Smith, et al., as intrinsically evil, since those doctrines define a social order in which the prosperity of a few, is premised upon the subjugation of the many to the status of dumbed-down virtual human cattle. In opposition to such wicked doctrines as those of such neo-Cathars, the American System of political-economy is premised upon the efficient sharing of participation in a system based upon increasing the productive powers of labor, an increase effected through fostering and employing increasingly capital-intensive investment in scientific and technological progress; through fostering the universal increase of the productive

powers of labor.

Such progress confronts us with three leading propositions. First, progress as expressed by the individual's economically efficient relationship to the state of affairs of the existing society; second, the physical condition of the society in which that individual is acting; and, third, the care for the welfare of the individual member of society, including the transmission of the store of knowledge of principles, culture per se, to the development of the individual, especially the immature, new individual.

Therefore, the primary function of government is *to conspire* to provide and maintain the system which responds to those requirements. This intention is best served by the American System of political economy.

That *system* has three leading components: *basic economic infrastructure*, the economic responsibility of government; *economic entrepreneurship*, the economic function contributed by the individual proprietor; and, *culture in the Classical sense of that term*. These characteristics of the American System of political-economy are expressed essentially in the Preamble of that U.S. Federal Constitution which is everywhere subject to the controlling principles expressed by the Preamble.

Three essential principles are expressed by that Preamble, two primary, one an important corollary. First, the principle of perfect *sovereignty*; second, *the principle of the general welfare*; and, third, that *the general welfare is defined as including that of posterity*, not only those presently living.

The significance of that Constitution, as defining an historically exceptional quality of U.S. accomplishment, is best demonstrated by looking at the axiomatic folly embedded in the European models of parliamentary systems.

To begin, we should stress that anyone who regards U.S. constitutional law as rooted, in any sense, in the English *Magna Carta*, is a hoaxster or a fool. The *Magna Carta* was intended and applied to defend the form of baronial anarchy characteristic of a feudal system of virtual slavery. The intent was to protect the privileges of "serf-holder value" from any attempt to establish a sovereign nation-state accountable for the general welfare of the nation and its people. The imposition of that *Magna Carta* typifies the order of Europe during the brutal near-millennium of domination of Europe, and other parts of the Mediterranean region, by the imperial maritime power of Venice's financier oligarchy. Throughout most of the centuries during the interval from the death of Charlemagne until the death of England's Richard III, Europe and the adjoining Mediterranean region were dominated by a partnership between Venice and the brutish Norman heritage of William the Conqueror and his Plantagenet/Anjou successors.

The Norman conquest of England, and all of the Crusades, were a continuing expression of this Venice-orchestrated alliance of so-called "ultramontane" interests against recurring efforts to establish sovereign states. The efforts to "globalize"

2. Cf. Carl Gauss's 1799 announcement of the discovery of the fundamental theorem of algebra is the Classical refutation of the axiomatically "ivory tower" mathematics of d'Alembert, Euler, and Lagrange, and also of Laplace, Cauchy, Clausius, Grassmann, Felix Klein, Ernst Mach, et al. Gauss's argument echoes those of Archytas, Plato, Eratosthenes, et al., showing that there exist only physical solutions for the doubling of the square and cube.

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

the world economy today, are an attempt to resurrect the depraved conditions of life under medieval Venice's imperial sway. The rise of Venice-orchestrated religious warfare within Europe, from 1511 through 1648, was a product of this same ultramontane interest.⁴

With the decline of the temporal power of the city of Venice, following the 1648 Treaty of Westphalia, the Venice model of financier-oligarchical forms of imperial maritime power, was adopted by the rising financier oligarchy of the Netherlands and England. The cases of William of Orange and the Eighteenth-Century British East India Company, typify this development. It is fairly said, that the parliamentary systems of Europe since 1648, owe most of their axiomatic characteristics to the legacy of either Venice's traditional asset, the Habsburgs, or the Anglo-Dutch imperial maritime form of oligarchical model.⁵ The axiomatic difference between the United States' constitutional American System of political economy, and British capitalism, and also Marx's principled opposition to the U.S. economy and Constitution, are rooted, respectively, in the Venetian characteristics of Anglo-Dutch financier-oligarchical models and Marx's scientifically illiterate defense of the British model against the contrary American system.

Thus, the most characteristic feature of governments derived from the Venetian imperial-maritime model, is the establishment of a private corporation, a "central bank," as a separate, ruling financier power: a virtual power over governments, as Presidential candidates Gore and Bush agreed in their 2000 campaign debates. The U.S. Federal Reserve System, created at the direction of the personal banker of England's Edward VII, Ernst Cassel, through Cassel's New York agent Jacob Schiff, is such a Venice-style echo of Venice's medieval Lombard banking system of Bardi, Perruzzi, et al. The new form of International Monetary System (IMF), launched on August 15, 1971, has since shown itself, as in the cases of Argentina and Brazil, a faithful heir of that Lombard banking-system which wiped out one-third of the population of Europe during the mid-Fourteenth-Century "New Dark Age."

Lacking a form of Presidency specified by the U.S. Federal Constitution, the parliamentary systems of modern Eu-

rope have been the lawful prey of either foolish monarchs, such as Edward VII, Kaisers Wilhelm and Franz-Josef, and Czar Nicholas II, or of those central banking interests which act in concert to topple elected parliamentary regimes almost at whim.

The root of the centuries-long conflict between the American patriots, such as Lincoln and Franklin Roosevelt, on the one side, and the American Tories, since Judge Lowell and Jeremy Bentham's agent, the Bank of Manhattan's Aaron Burr, on the opposing side, is this issue of central banking. It is a matter of principle, that a government which is unable to exert sovereignty over its credit, currency, and banking system, has no real sovereignty at all. Only as under a Presidency as powerful as Franklin Roosevelt's was, can the Venetian-style oligarchical insolence inherent in an existing central banking system be held in check. The appropriate measure for all times, is typified by Treasury Secretary Alexander Hamilton's design for a U.S. National Bank.

What Was LaRouche's Conspiracy?

At this point, for the sake of clarity, I shall now shift for a while, to referencing myself in the third person singular.

That axiomatic conflict between sovereign government and central banking, has been the uninterrupted issue of a LaRouche Presidential candidacy since 1975. As official FBI documents and comparable sources have documented repeatedly, since 1973, the combination of Lyndon LaRouche's uniquely vindicated long-range forecast of what happened on August 15, 1971, combined with LaRouche's humiliating defeat of Professor Abba Lerner, in a celebrated public Autumn 1971 debate at Queens College, marked LaRouche as an intellect to be feared by the financier interests which had launched the new, floating exchange-rate monetary system on August 15, 1971. LaRouche's 1975 announcement of his 1976 Presidential candidacy, his launching of a Middle East peace initiative in April of that year, and his simultaneous proposal for an emergency international, gold-reserve-based monetary reform, produced vivid, often even paranoid expressions of intellectual fear from relevant quarters, such as then Secretary of State Henry A. Kissinger.

The problem has been, that since the assassination of President Kennedy, no President has challenged the post-Roosevelt arrogance of the Federal Reserve System. Since 1976, no currently prospective U.S. Presidential candidate but Lyndon LaRouche has shown the indispensable combination of knowledge and commitment to principle, required to challenge those reigning American Tory interests (including traditional organized-crime interests) which presently exert jointly, top-down control over the political parties and many parts of the Executive and Federal Court. The issue has been: Will the leading parties, and the voters generally, continue to support only Presidential candidacies acceptable to the Tory forces controlling the Federal Reserve System? If we continue to support that system of selection even now, the United States

4. Much credit for ending that war belongs to Pope Urban VIII and his special diplomat, France's Jules Cardinal Mazarin. Mazarin was key in bringing about the Treaty of Westphalia. For that reason, Mazarin's Jean-Baptiste Colbert has been bitterly hated and libelled by the Netherlands and British followers of the Venetian oligarchical model, ever since. The development of what became the American System of political-economy owes much to Leibniz's alliance with the circles of Colbert.

5. In modern history, the Spanish and Austrian branches of the Habsburg monarchies are expressions of a broader *Fürstentum* assembled from a recurring alliance of feudal princes often operating under the title of "Holy League." This body was usually more powerful than the monarch himself, and usually ran the secret police agencies (e.g., *Geheimpolizei*) through the *Fürstentum*'s control over Chancellors such as the famous Prince Metternich.

is probably doomed to an early end of its existence in its present constitutional form, and to a hopeless plunge into something far worse than a mere depression, into a general breakdown crisis.

President Reagan had some of the essential qualities of a President, and, beyond reasonable doubt, Bill Clinton was, personally, the most intelligent of the Presidents since Jack Kennedy. However, if the President of the United States lacks the combination of intelligence, knowledge, and guts, to take on the American Tories' financier oligarchy, directly, consistently, without vacillating as all political opportunists do, "He ain't worth shucks" in today's crucial moments of existential crisis.

Suppose a candidate now qualified for the Presidency is presented. Would the majority among citizens support that candidacy? Offhand, most observers would agree, "Probably not." If they are right, what happens to the U.S.A.? Therefore, as was the case with the self-doomed citizens of Italy under ancient Rome, the greatest source of danger to the people of this nation is their own current popular opinion. That popular opinion is also a system, the system which is, in fact, the greatest single threat to all of them today.

Such was always the cause of a nation's doom, on the stage of Classical tragedy, or real-life tragedies of actual nations or cultures. The root of a self-inflicted national tragedy lies in the smallness of the mental life of the people; tragedy is what a people, a popular culture, does to itself.

If you have not been working to change popular opinion, as candidate LaRouche is doing, you were not qualified to become President in 1976, 1980, 1984, or any later time, up to the present. A real crisis requires real leaders, like Athens' Solon, even if the only such available are wise-cracking old geezers. Real leaders, in such a time, are those who challenge the authority of the foolish popular opinion which got us into the mess; the cowards appeal to the very prejudices which they seek out and to which they appeal; they have created the disaster. Otherwise, the cowards and bunglers reveal themselves to be such, by their attacking isolated, so-called individual "issues," usually local or special-constituency issues, rather than the actually determining role of influential personalities in all crucial historical matters. *Real leaders for a time of crisis are those who act for relevant, competent, axiomatic changes in the existing system. Such is the lesson which history had already taught to those wise enough to have learned.*

1.1. Where Transportation Fits In

The chief feature of the general division of labor in a healthy form of modern nation-state, is the distinction between what are distinguished from one another as, on the one side, basic economic infrastructure and, on the other, the role preferentially assigned to private entrepreneurship in such categories as agriculture, manufacturing, and relevant learned

professions and useful crafts.

Essentially, speaking in broad terms, that which pertains to the relative universality of all the general area of land and sea, and to the entire population occupying that territory, is the responsibility of the sovereign nation-state and its agencies of government. That which pertains to the particular individual, family, or to persons associated in some closely held private enterprise, should be usually treated as within the province of private enterprise.⁶ General transportation, by sea, ports, inland waterways, rail, and also public highway systems, typifies the government's unique responsibility and authority for creation, maintenance, and direction of basic economic infrastructure. General land-maintenance, development and management of water resources, related functions of public sanitation, the general production and distribution of power, are also typical subjects of the inalienable responsibility of government to promote, protect, and regulate for the benefit of the general welfare.

Such typical elements of hard infrastructure, are complemented by essential elements of universal social welfare, principally education and the health-care and sanitation systems which support and complement the private role of the medical profession.

The principal other aspect of a national economy, is the application of the sovereign creative powers of individuals, such as private entrepreneurs, to a local part of the whole territory and population. The technologically progressive farmer is typical, as is the technologically progressive variety of closely held entrepreneurship in manufacturing, or skilled technical services.

Thus, the essence of real economy (*physical economy*), is defined by the distinction between the two interdependent elements of the economy as a process, as a *system*: the physical economy of the territory and population of the nation as an indivisible whole (the relative *universal*) and the role of the *particular*, sovereign individuality within the process as a whole. The function of transportation can not be competently defined, except by addressing that subject in terms of that relationship between the universal and particular.

For purposes of first approximation, start from the late Professor Wassily Leontief's contribution to developing a system of accounting for the U.S. national economy in linear

6. Today's publicly held joint-stock corporation, is, typically, a different order of species than an entrepreneurship. The latter functions under the intent of the right to hold and use personal property under the protection and rules of government, and within the bounds of the "general welfare clause." Although this is specific to the U.S. Constitution, the notion of a commonwealth was the principle of natural law underlying the practice of post-feudal, modern European civilization since France's Louis XI and England's Henry VII. The moral inferiority of the Wall Street-controlled variety of large corporation to the entrepreneur has gone to extremes, for the worst, under the impact of the recent thirty-five years cultural paradigm-shift, especially since Zbigniew "technetronic" Brzezinski's 1977-1981 reign as National Security Advisor.

terms of approximation. Actually, a linear input-output model describes only an economy at the first moment of its death; a viable economy is intrinsically a non-linear system of a Riemannian type, as I have defined this.⁷ Nonetheless, the Leontief model illustrates some crucial facts about the economic function of mass transportation. After that fact is presented, we can proceed to address the way in which transportation functions in a healthy, non-linear economy, rather than an implicitly dead, linear-mathematical model of the axiomatically pathological John von Neumann, systems-analysis type.

The 'Worldwide Cup of Coffee'

The particular production of a product at some particular location in the world's economy as a whole, depends, today, upon inputs to the location of that production from many parts of the world. This input includes labor, materials, power, and so on. The analysis of local production, requires estimates and management of items listable on what are termed "process sheets" and "bills of materials." The items so listed, as supplied from other production, include production from various parts of the world as a whole.

In teaching a course in economics, at various college and university locations during the 1966-1973 interval, I included the concept of "a world-wide cup of coffee." I situated the class's attention on the idea of sitting in a diner where they are presented with a cup of coffee. I asked them to back-trace the ultimate origin of everything represented by that cup of coffee. This included not only the coffee beans, but the water, the cup, the spoon, the milk, and the sugar; but also the diner within which it was being served, including the stool and other fixtures of the diner; and also what was required to produce and support the families of those employed there. I asked them to consider not only the quantities from each source, but also the cause-effect time-sequences involved. Thus, the students found themselves staring at that imagined cup of coffee, and seeing much of the history of world-wide mankind reflected in that object before them.

All of the ingredients transmitted, to be expressed by that cup of coffee, involved a system of transportation. Think of certain similarities between that process of transportation and the interdependency expressed among cardio-vascular, lymphatic, digestive, respiratory, and nervous systems. At each interval along each of those pathways of movement, things are happening, entering and departing the conduit represented by the system as a whole. The existence of every process through which these conduits are leading, is essential to some aspect of the adjacent activity at each point along the pathway. The system is no mere "pipeline," no mere conveyor belt; it is an active organism.

Compare the development of the railway system in the United States, from the work of German-American economist

Friedrich List through the completion of the first transcontinental link, under the influence of Abraham Lincoln. The transcontinental system transformed land-area from a relatively primitive economic state into regions of rich agricultural and other development along the flanks of the right of way. The railway was creating physical economy within the region through which it moved, and the railway became the mode through which the resources of relatively remote areas could be accessed, and then combined, to produce the explosive growth of agro-industrial power of the U.S.A.

Actually, the railway system was developed at no net cost to the U.S. economy. *Even if that railway system produced nothing else, the production facilitated by such mass transit increased the per-capita productivity to such effect, that this benefit exceeded greatly the actually incurred capital and operating, physical costs of the transportation system.* The ability to effect the assured delivery of passengers and freight, from any locality within the nation, to any other locality within the nation, was a principal source of the growth of national productivity, from the time of the Lincoln Presidency, until the wrecking of the agriculture and other essential parts of national economy, under the 1977-1981 direction of National Security Advisor Zbigniew "Technetronic" Brzezinski's program of "deregulation."

It was not the operating costs of that rail system which ruined it. It was the cannibalistic looting of almost everything by Wall Street's and London's parasites, combined with the catastrophic effects of deregulation, which virtually destroyed a railway system whose contribution to net national physical income exceeded the actual combined depreciation, maintenance, and operating costs incurred. In a rational system, long-range truck transport's inherent costs borne by the national economy, are far greater, per ton mile, than a technologically modern form of well-managed, integrated national rail system.

By a rational system, one means one in which freight-rates and schedules provide a local community with a quality of service at a cost per ton to the shipper no higher than available for major markets. Entire regions of the U.S. national economy have been murdered economically by Brzezinski-led, cannibalistic "deregulation" of transportation and other categories of basic economic infrastructure. Brzezinski and his accomplices destroyed precious physical capital; their looting operations down-shifted the U.S. economy as a whole to a qualitatively lower level of national productivity per capita and per square kilometer.⁸

When the economy is examined in axiomatically non-linear terms, rather than the linear input-output models of Leontief et al., the most crucial features of the national rail-transport network become clearer. Refer to my description of

7. LaRouche, op. cit.

8. U.S. government and Federal Reserve reports published since 1982, have been dominated by an increasingly massive ration of willful accounting frauds, conducted under the rubric of "hedonic values."

“the third view,” the Riemannian view, earlier.⁹

To the degree the individual or society acts according to stubborn tradition, he or that society is behaving as an animal, not a human being. An animal can learn, but the limit of its learning is defined by what we may term loosely, and fairly, as the creature’s genetic heritage. The creature can adapt to its environment through learning, but its powers of adaptation are limited by what are ostensibly the outer limits determined by its (his, her) biological heritage. Similarly, to the degree that the members of society act according to sense-certainty, the same kind of limitation prevails. It is only as the person goes outside habitual, or customary belief and behavior, that a culture is qualified to continue to survive more or less indefinitely.

The only existing physical proof, that the human individual is better than a mere animal, is the ability of the individual member of the human species to generate the discovery of an experimentally valid universal physical principle, such as Johannes Kepler’s uniquely original discovery of the principle of universal gravitation.¹⁰ The discovery of those types of universal physical principles, or the re-enacting of such a discovery, as by a student, is the act which distinguishes the man and boy from the monkey.¹¹ Through the discovery and application of such discovered principles, society is able to burst the kind of biological limits which impose an approximately fixed upper limit on the potential relative population-density of the higher apes, thus raising the potential population of the human species from mere millions of individuals, to billions today. Such efficacy of universal physical principles of those characteristics, serves mankind as a standard of

9. A truly non-linear view bans all ivory-tower mathematics, such as that of Euler, Lagrange, Laplace, Cauchy, et al., from physical science, and replaces the space-time assumptions of a Cartesian model with a system in which only experimentally proven universal physical principles are accepted as mathematical “dimensions.” See Riemann’s 1854 habilitation dissertation, *Über die Hypothesen, welche der Geometrie zu Grunde liegen*; (New York: Dover Publications reprint, 1953). For example, in his 1761 *Letters to a German Princess*, Newton doctrinaire Leonhard Euler premises his attack on Leibniz’s infinitesimal calculus, on the assumption that infinitesimals do not exist, arguing that straight lines can always be drawn between two points along a line of the shortest possible distance. Hence, Euler, like Lagrange, Cauchy, et al., degrades physics to a mathematics based upon linear systems, in opposition to the definition of the catenary as a *physical* curvature expressing universal least action. The latter, as shown by Leibniz and Jean Bernouilli, is the basis for the definition of the infinitesimal calculus. This notion of *physical geometry*, as opposed to the “ivory tower” geometries of Euler, Lagrange, Cauchy, Grassmann, et al., is expressed by Gauss’s 1799 definition of the complex domain, as opposed to the delusion of Euler, Lagrange, et al.’s assertion that the square root of minus-1 is merely an “imaginary” number. The complex domain expresses the efficient existence of a physical-geometric domain, as distinct from an essentially arithmetic one. The catenary is the typical physical curvature of the complex domain.

10. *The New Astronomy* (1609).

11. As I have already specified, a principle of social cooperation which enables society to apply such physical principles, is also an experimentally provable principle.

knowable truth.

The fostering and application of such discoveries, to the effect of increasing the potential relative population-density of society, is the proper physical definition of *economic profit*. Without such profit, the marginal depletion of currently employed natural resources would result in a lowering of the effective per-capita physical income of society, resulting in an economic loss through technological attrition. The watchword becomes, thus, “progress or die!”

All known cultures existing prior to Europe’s Fifteenth-Century Renaissance were thus either doomed, like ancient Babylon and Roman culture, or collapsed into a prolonged relative dark age. The cause for this collapse was either intellectual scientific and moral bankruptcy of the culture, as in Babylon and Rome, or, in the case of the relatively superior culture of Classical Greece, the subjugation of a large part of the population to the abused condition of human cattle, even slavery. So, the hegemonic culture of medieval Europe, as typified by that Venetian-Norman abomination, the Thirteenth Century’s Holy League, plunged all of Europe into the genocidal New Dark Age of the Fourteenth Century, the dark age from which the Italy-centered, Fifteenth-Century platonic Renaissance not only rescued the previously shattered Papacy, but also gave birth to that modern European civilization which the Venice-led, Sixteenth-Century anti-Renaissance sought to drown in religious warfare.

The only assurance of continued prosperity, is the fostering of the intellectual development of all of the people of society, the practice of the common good, the promotion of the general welfare. This requires the collection and transmission of the truthful discoveries of other societies, as well as those of our predecessors. The reliving of those inherited discoveries of principle, combined with the devotion to effecting and sharing new discoveries of universal principle, ensures the optimal moral development of the character of the young. This provides the climate in which an optimal ration of the members of society will participate in the promotion of progress. This fostering of such participation by the individual, is the reality for which the use of the term “freedom” should be allowed.

Such are the rightly included goals to be served by aid of mass transportation. The moral and economic effects are two faces of the same coin. The “bloodstream” of mass transportation also transmits ideas and their application, as expressed in the form of technologies spun from the thread of scientific discovery, and expressed in the forms of products and techniques. Thus, the development of the U.S.A. through highways, canals, improved river courses, and rails, was more than the transport of things; it was the transmission of ideas, and of the means needed to express those ideas in forms of physical practice conducive to the fostering of accelerated rates of scientific and technological practice. The innovative spirit of the progressive farmer and mechanic, transformed such objects into, not merely objects of consumption, but

stimulations of the innovative potential of the users of those products. Henry Ford's Model T, is a celebrated example of this. The development of the integrated generation and distribution of electrical energy in cities, characterized the upward leap of the industrial revolution during the early decades of the Twentieth Century; rural electrification launched under Franklin Roosevelt produced similar effects in agriculture.

Not only is a national railway grid like a living tissue; it is a living tissue, a living interaction among the cognitive powers of the people who are participating in the activity organized around that economic bloodstream. What is being transmitted is the combined maintenance and increase of the productive powers of labor.

2.0. Hard and Soft Infrastructure

All competent teaching and practice of economics for today's world conditions incorporates the concept of the *Noösphere* presented by Russia's Vladimir I. Vernadsky, as combined with two corrections borrowed from my own original, parallel contributions to the science of physical economy. This use of Vernadsky's work is crucial for defining global and national infrastructural policies for today's circumstances. I summarize the relevance of this point.

The pivotal feature of Vernadsky's successive definitions of the *Biosphere* and *Noösphere*, is his work in founding the branch of physical science known as *biogeochemistry*. The first phase of his discoveries led to the definition of the *Biosphere*. The same method led subsequently to his definition of the *Noösphere*. The only two crucial shortcomings I find in those published achievements reported to me by relevant specialists, including translations of relevant writings by him, are that he did not live to complete his intended mastery of Riemannian physical geometry, and that his presented conception of the human intervention creating the *Noösphere*, does not include explicit recognition of those elements of Classical principles of artistic composition which provide society the ability, in the words of Shelley, to promote the power "of imparting and receiving profound and impassioned conceptions respecting man and nature."¹²

A very brief summary of relevant features of his development of the conception of the *Biosphere*, will probably be sufficient for the discussion of our present topic, the policy which must underlie a modern notion of basic economic infrastructure.

Since Kepler's successful discovery of gravitation and related matters, Kepler's discovery and proof of that principle has been the standard of reference for building a competent form of systemic mathematical physics, one based on experi-

mental proofs of discovered universal physical principles.¹³ The discovery of a valid universal scientific principle, begins with evidence which stubbornly defies current methods of systemic interpretation of some aspects of sense-perception. The experimental validation of the hypothesis which overcomes that paradox, defines a working scientific principle. The suitably exhaustive further experimental work may, then, refine and define that as a *universal* physical principle, such as Kepler's definition of universal gravitation.

The work of Louis Pasteur and his followers presented geologist Vernadsky with crucial evidence of mathematical-physical differences of universal physical principle between the chemistries of living and non-living processes. Vernadsky, as a geologist, took into account the evidence of fossils provably products of the activity of living processes. These fossils included the Earth's oceans and atmosphere, and included the outer surface of the planet down to a considerable number of kilometers below sea-level. The resulting picture of the geological evolution of the planet, including its atmosphere, defined a *Biosphere*.

From the vantage-point of that same method, Vernadsky defined a higher state of existence, called the *Noösphere*. In the case of defining the *Biosphere*, his experimental method focussed upon physical effects *systemically* incongruent with physical chemistry's known classes of abiotic processes. In examining the impact of human activity on the *Biosphere*, he defined a universal physical principle, which he termed *noësis*, which corresponded to effects beyond the *systemic* capacity of all known living processes excepting human activity. *Noësis* signifies the class of mental activity which generates the discovery of those hypotheses which qualify experimentally as universal physical principles.

So, as the *Biosphere* presents us with life stubbornly taking over the outer regions of our planet, so the action of *noësis* exhibits itself as, in the longer run, superior to merely living processes in general. Hence, the *Noösphere*.

The resulting image of our planet, is of an evolving entity, within the Solar System, and, thus, the universe. Three mutually distinct categories of action are constantly transforming this planet, interacting with one another, and who knows what else besides. These processes, the abiotic, the living, and the cognitive (or, *noëtic*), are distinct, but interacting, and, in that sense, also interdependent. Let us say that they are *multiply-connected* processes, or "*multiply-connected phase-spaces*."

Now, since the scale and impact of man's impact on what are called "natural resources," has become relatively large,

13. Kepler's scientific method was derived, ultimately, from Plato's Socratic dialogues, but Kepler's immediate predecessors were, as he emphasized, the founder of modern experimental science, Nicholas of Cusa, and Cusa's followers Luca Pacioli and Leonardo da Vinci. It was the challenge of Kepler's work which prompted the work of Fermat, Pascal, Christiaan Huyghens, Leibniz, et al., through the completion of the foundations of mathematical physics by, chiefly, Gauss and Riemann.

12. LaRouche, op. cit.

especially when compared to the situation during earlier centuries, it were inevitable that mankind must now think of giving a helping hand to those planetary abiotic and living processes of our Biosphere. If we presume that we are going to continue, and accelerate, scientific progress in discovery and use of universal principles, we must develop ways in which to assist the Biosphere in producing those preconditions which expanding human life will require, if we are to maintain and also improve the average conditions of life for a growing human population throughout the planet. We must do things in the sense of making the deserts bloom, and must apply principles of public sanitation in a richer sense than during earlier generations.

In this vein, we must consider what has been termed “basic economic infrastructure” as the relatively “hard” form of basic economic infrastructure, as man-made improvements in the Biosphere. This includes nationwide and continental systems of transportation, regional systems of integrated generation of power, national and international systems of water management, extensive systems of land reclamation and maintenance, and the rational design and management of cities and the relationship of urban life to, and integration with countryside of field, mountains, and forests. These are matters which come under the special domain of government; private entrepreneurship may play an important, even indispensable helping role, but the responsibility and authority for the outcome lies primarily with government.

Now, to the matter of “soft infrastructure.”

Classical Humanist Education

From the standpoint of even ordinary schoolbook physical science, the provable distinction of the human species from all other forms of life, is expressed by comparing the potential relative population-density of the human species, with that of the higher apes. The human potential is expressed in the millennia-long span of an increase from a few millions, to present billions. This is an increase of a type which occurs in other species only through genetic “evolution.” For us, it is a potential for increased potential which occurs equally, and universally, among all branches of the human family; it occurs, for example, in the same degree, among children of what are falsely called “aboriginal” stocks of persons in Australia, as anywhere else.

This point defines the axiomatic quality of difference between a competent form of general education, known historically by such names as “Classical humanist education,” and the monstrously corrupt forms of education prevalent in U.S. practice and doctrine, including that of universities, today. The need for our return to the conception of a Classical mode of humanist education, corresponds to an indispensable element of the improved economic infrastructure which must be built into the U.S.A.’s public life today.

To make this point comprehensible, I must now summarize a crucial scientific argument I have made repeatedly in

earlier locations, an argument which is axiomatic in all of my contributions, over five decades, to the development of the science of physical economy.

Famously, Plato emphasized that what human beings experience with their senses, as usually perceived, are merely shadows, as on the walls of a dimly fire-lit cave, as the Apostle Paul warns famously in *I Corinthians* 13. Our sense-apparatus is an integral part of our biology. The world acts upon that sense-apparatus; it is the reactions of those sense-organs, the *shadows* of the real universe, which are immediately conveyed to our consciousness. Plato’s Socratic dialogues, and *Laws*, taken as a whole, are a special quality of outgrowth of Classical Greek drama, a collection of spiritual exercises, by aid of which the human mind is aided to sort out the paradoxical relationship between the shadow-world of sense-certainty, and the real universe which those shadows imperfectly reflect.¹⁴

In modern physical science, the most important opponents of a competently scientific practice include the René Descartes whose misconceptions of space, time, and matter, degrade mathematical practice to the kinds of crudities which polluted the work of such otherwise able mathematicians as the “ivory-tower” formalists Euler and Lagrange.

On that pivotal point: In my current choice of pedagogy, I emphasize five points of pedagogy as the elementary basis for a comprehension of the way in which the issue of appearance versus reality arises: a.) Kepler’s actual process of discovery of universal gravitation, as elaborated in his 1609 *New Astronomy*; b.) the comparison of Classical Greek treatment of such problems as the doubling of the square and cube, with Gauss’s 1799 publication of his discovery of the fundamental theorem of algebra, in which he exposes the relevant axiomatic follies of D’Alembert, Euler, and Lagrange; c.) the Leibniz-Bernouilli proof of the coordinate principles of the infinitesimal calculus and universal least action, in their exploration of the implications of the catenary; d.) the emergence of Riemann’s 1854 definition of physical geometry on the basis of Gauss’s earlier development of the notion of general principles of curvature, a notion of curvature emergent from Gauss’s 1799 report on the fundamental theorem as point of departure.

The typical fallacy in contemporary discussion of the paradoxical character of sense-certainty, is most efficiently shown by indicating the intrinsic incompetence of efforts to derive a physics from either a Cartesian view of geometry, or the even cruder basis of a counting arithmetic. Since the Classical Greece of Archytas and Plato, the essential progress of scientific thinking has been premised on defining and solving those ontological paradoxes which arise in the misguided effort to degrade physical science to the status of a mere hod-carrier for an “ivory tower” mathematics of

14. Plato’s method is reflected in the work of Leibniz, from whose writings I was originally educated in these matters.

the type presented by Descartes.

Back to Kepler.

During the Sixteenth Century, doctrines on the subject of astronomy had reverted from the Solar hypothesis of both Aristarchus and founder of modern science Cardinal Nicholas of Cusa, to the medieval dark-age's mysticism of Aristotle, as typified by common features of the work of the ancient Claudius Ptolemy, and also Copernicus and Tycho Brahe. All three were in accord with the gnostic, ivory-tower dogma of Aristotle, insisting that man could not know the efficient causes of action, but must accept the appearances judged in terms of presumably unchanging principles expressed by what was assumed to be "perfect" uniform motion. Kepler's more precise calculations showed not only that the orbit of Mars was elliptical, but that motion along the orbital pathway was never uniform. This signified what Kepler defined as a controlling "intention," embedded in the universe, evidence which discredited Aristotle's dogma absolutely. Thus, Kepler defined that efficient intention as a principle operating on the universe from outside Aristotle's dogma. This intention was identified as a universal principle whose effect is observed as gravitation.

One can not perceive gravitation as an object; yet it is an efficiently acting universal physical principle. Gravitation is *real*, and perceived evidence of its effect is the shadow of reality. With Riemann's announcement at the outset of his 1854 habilitation dissertation, all ivory-tower conceptions of space, time, and matter, were, speaking figuratively, thrown into the waste-basket, as unwanted relics of a superstition-ridden past. Among literate and honest scientific opinion, only experimentally proven, universal physical principles could be accepted as the geometric "dimensions" of a universal physical geometry.

This was not entirely a new discovery. Already, during the interval from Archytas and Plato, through the work of Eratosthenes and Archimedes, Plato and his associates had recognized that the physical differences among the notions of line, surface, and solid, were not consistent with a naive conception of linearly extended space and time; the difference among these species of physical existence represented the action of specific *powers*, as Plato emphasized in his *Theaetetus* dialogue. This notion of powers, is that employed by Leibniz for defining a science of physical economy; it is the use of the notion of powers employed by Gauss in defining the fundamental theorem of algebra, the same notion Gauss employed in number theory, in defining the significance of residues. The appearance of the falsely named "imaginary numbers" in number theory and geometry, is a reflection of the efficient existence of such physical powers for defining all mathematics suited for the practical requirements of physical science.¹⁵

Science does proceed from a critical attitude toward pre-existing notions of the organization of action in physical space-time. Thus, it does proceed, in fact, from describing, from an historical perspective, a naive conception of space, time, and matter, a conception more or less consistent with sense-certainty. It is by uncovering the fallacies of sense-certainty, by discovering the principles required by encounter with ontological paradoxes, that mankind overcomes a childish faith in the shadow world of sense-certainty, to discover those universal principles, by means of which we act to increase man's power in and over the real universe. Examples of the pathway of scientific progress, include: the ancient discovery of the doubling of the cube, like Gauss's similar discovery of the fundamental theorem of algebra, and Leibniz's and Bernoulli's kindred discovery of the meaning of that curvature—the catenary—known as expressing both the principle of the infinitesimal calculus and universal least action. The catenary, so understood, is a specifically physical-geometric existence, and is the most typical expression of the physical reality of the complex domain's universality.

The term *knowledge* were, therefore, rightly restricted to the cumulative progress away from the merely learned crudities of sense-certainty, through successive discoveries of universal physical principles. These discoveries have the form of that principle of *hypothesis* typical of Plato's Socratic dialogues. Thus, as illustrated by the successes of nuclear microphysics, we become able to act efficiently upon the unseeable reality beyond the reach of the senses; we become able to manipulate the unseen reality which controls the shadows.

So, experimentally valid physical science assumes the form of a special quality of latticework. The unfolding of that lattice of increasing knowledge of reality, describes the freeing of mankind from the darkness of sense-certainty. Discovery by discovery, as typified by ancient Greek science's still durable discoveries, the light of reason guides our hands into the real universe, beyond the shadows of perception. Man's power in the universe increases. The study of the cumulative benefits of this process of discovery of such knowledge, a process leading upward and away from simple sense-certainty's systems, is called the *epistemology* of what is recognized today as the subject-matter of physical science.

Vernadsky's distinction among the powers of the respectively abiotic, living, and cognitive domains, is an example of the way in which physical science has, in fact, applied the principles of epistemology to itself. He applies the Classical method of experimental hypothesis and proof of principle, to the subject of physical science in general, including the generality of mankind's process of discovery of universal physical principles.

However, that experience of the progress of science, from the Classical Greek of Archytas, Plato, et al., through modern times, demonstrates the existence of a still higher principle

15. Hence, Riemannian geometry is not a non-Euclidean geometry, such as those of Lobatchevsky and Bolyai, but as Gauss's teacher Abraham Kästner had argued, an anti-Euclidean geometry, which scrapped the axiomatic onto-

logical assumptions of Euclid respecting space, and replaced these with nothing but a physical geometry of physical-space-time.

than any of those I have referenced here thus far. No lower form of life is capable of effecting the progress from an ontological paradox, to an hypothesis, to the proof of that hypothesis as a principle; this can be accomplished only by the sovereign cognitive powers of the individual human mind. This is the principle, the *power*, which distinguishes humanity absolutely from all lower forms of life.

The proper function of education, is to afford the developing young individual the means to become assured of his or her command of that higher principle which sets the human being above all other species, the principle of hypothesis as I have just described it. This is accomplished by creating the circumstances, including education, in which the developing individual re-enacts important discoveries originally made in the past. This includes physical principles of the type I have just illustrated, above. It also includes principles which belong to the category of principles of Classical artistic composition.

Classical Artistic Composition

As indicated above, the two crucial omissions in Vernadsky's definition of the Noösphere, were the absence of reflection on that anti-Euclidean quality characteristic of all competent representation of modern European science since the work of Leibniz, Gauss, Riemann, et al.; and lack of attention to those social processes, on which society depends for the transmission of valid discoveries of principle as actual knowledge. I mean knowledge, rather than forms of classroom learning associated with rehearsals for the monkey-see-monkey-do performances known as responding to computer-scored multiple-choice questionnaires.¹⁶

The history of the transmission of valid discoveries of universal physical principle, provides a relatively obvious, more readily understood approach to the principled feature of social relations which must be taken into account. The significance of the principles of artistic composition in both plastic and non-plastic art-forms is rarely recognized today. On the latter account, the reader might reference C.P. Snow's *Two Cultures*.¹⁷ The relevant issue of education is: Is there a principle of *truthfulness* in Classical artistic composition, as experimental method provides a standard of truthfulness in assessment of proposed universal physical principles of science? Classical humanist education is premised on the evidence that such a principle of truthfulness applies.¹⁸ Actually,

16. Compare education keyed to multiple-choice questionnaires with the educational practices described in the "Voyage to Laputa," from Jonathan Swift's *Gulliver's Travels*.

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

18. The most extreme opponents of a principle of truthfulness include the radical positivists, including the devotees of Bertrand Russell and the existentialists as typified by Theodor Adorno, Hannah Arendt, et al., in *The Authoritarian Personality*, (New York: Harper, 1950). Notably, Arendt traced her defense of the position, that there is no truth, but only opinion, from the reading of Immanuel Kant's *Critiques* by fellow-existentialist Karl Jaspers.

the same principle of truthfulness applies to principles of Classical artistic composition, as to the history of knowledge in physical science, as I shall indicate summarily here.

For such reasons, the study of the principles of Classical humanist education properly begins with focus on the way in which valid original discoveries of universal physical principles are to become experiences replicated by present-day students and others. The picture is then broadened, to show the same "mechanisms" at work in transmission of ideas by methods of Classical artistic composition. The picture is completed, by indicating the relevance of Classical artistic composition, as for scientific knowledge, for the understanding of history, and for the practice of statecraft by leaders and others alike.

Like all physical reality, the act of discovering a universal physical principle, is not an object of sensory perception. Like the discovery of any physical principle, we are able to prove the presence of such an act of discovery by the efficiency of that action. Thus, the central problem of communicating what are actually ideas, rather than merely opinions, is that such acts of cognition (noësis) are products of a perfectly sovereign process within an individual mind.

As Plato's Socratic dialogues illustrate this fact, such an act of discovery has three principled phases:

1. The recognition of what is called an ontological paradox, a paradox which threatens one's confidence in previously accepted ways of thinking; 2. An hypothesis, which, if proven true, might overcome that paradox; and 3. A proof-of-principle test, such as an astrophysical observation or a crafted experiment, which disproves, or proves the hypothesis.

If an individual who believes he has discovered a universal principle wishes to communicate that discovery to another person, he must rely on the immediate fact that he can communicate two elements of that three-step discovery to a qualified second person. These two evidences are, the paradox and the experimental or equivalent evidence. This, of course, is exactly what should be the characteristic teacher-student relationship. Then, if the posing of the paradox by the first person produces a kindred hypothesis in the second, and if the empirical test bears that out, the generation of the hypothesis by the first has been replicated in the second. If the empirical tests do not substantiate the hypothesis, new tests must be made, and, possibly, more appropriate hypotheses.

That is the only way a valid hypothesis can be replicated in the mind of another. It can not be seen with the senses; its generation must be replicated. That may seem to be unfair; but, after all, to see the unseeable beyond the shadow-world

She reads Kant's intent correctly. The neo-Aristotelean reformers of empiricism, such as Kant, the ideologue of the fascist state G.W.F. Hegel, and Hegel's crony Savigny, used a neo-aristotelean denial of any comprehensive principle of knowable truth to, so to speak, bring their burglar friends in to loot the house. She makes one think of the *Pokémon* addict who responded to his mother's detecting his hand in the cookie jar by killing her with an axe. Before the court, the addict explained to the judge: "It was her fault. She peeked!"

of sense-perception, requires the help of an unseeable agency. That is the continuing importance of Plato's Socratic dialogues. The method of those dialogues is needed, to educate the cognitive powers specific to human individuals, which means to make the individual conscious of such activity within his or her own, sovereign mental processes.

A creative personality is one who has developed the ability to conceptualize his or her own cognitive processes as objects of intentional thought. The practice of epistemology is an example of such looking at the cognitive generation of hypothesis as an object of conscious attention. The development of such a capacity in the student, is the principal continuing objective of a Classical humanist curriculum. It is that self-development within the student, which fosters the moral development of the child and adolescent. That is the Classical humanist principle of education, if only in first approximation.

Look first at plastic, and then non-plastic art-forms, as I have now described an epistemological overview of physical science.

Classical sculpture. Classical Greece freed itself from the archaic practice of tombstone art, to produce off-balance figures with such refinement that the mind of the viewer saw not a static figure, but figures frozen in an infinitesimal instant of motion. This was applied not only to images of living figures, but to designs of products, architectures, even cities. I illustrate the importance of this Classical form of sculpture by an example from my personal experience.

During the middle to late 1980s, I was concerned with saving the famous cupola of the Cathedral of Florence from the effects of some ill-advised modifications brought about by a local government. I became involved with the work of an outstanding specialist in the matter. The crucial issue to be addressed was: what was Brunelleschi's physical principle of design of the construction of that cupola? I looked, and looked. It struck me: The hanging-chain principle, the catenary! Suddenly, it was all obvious; I looked at images of the cupola, and had the occasion to observe it again directly. I could see it all so clearly! My relevant scientist friend confirmed my discovery.

Brunelleschi had used the hanging-chain principle, explicitly, as his method of constructing the cupola. This was more than two and a half centuries before Leibniz and Bernoulli had settled the role of the catenary in defining both the proof of the infinitesimal principle of the calculus and the principle of universal least action. How was this possible? Look to the effect of such developments as the revival of Classical Greek culture, at the beginning of the Fifteenth Century, at Padua prior to the Aristotelean reaction there. A Classical humanist education produces an enriched state of the individual human mind, by means of which the principles of creative discovery common to physical science and Classical artistic composition, are reflected in a genius such as Brunelleschi, Nicholas of Cusa, and Leonardo da Vinci. Leibniz's

unrivalled genius reflects the post-1648 Classical renaissance which followed the awful "little dark age" of religious warfare, just as the developments around Padua at the beginning of the Fifteenth Century produced that florescence of genius largely crushed during the subsequent 1511-1648 little dark age.

The case of Classical sculpture and architecture shows the relatively obvious connection between Classical forms of plastic artistic composition and genius expressed in physical science. What of the non-plastic arts: Classical drama, Classical poetry, Classical musical composition—all in opposition to the Romantic and modernist?

In all poetry and prose deserving of those names, the function performed by paradoxes in mathematical physics, are accomplished by irony, including metaphor, and conjunction of moods. In spoken poetry and prose, meter, voice-registration, voice-coloration, and rubato effects, blended with gestures, transform a mere flow of words from recitation of mere text, into the prompting of intended idea in the mind of the hearer. In written prose and poetry, the spoken intent is conveyed by marks of punctuation, such as commas, which warn the reader of an intended prosodic change of spoken utterance, to be heard in the mind of the reader.

In music, J.S. Bach's development of a system of well-tempered counterpoint, employs the natural prosody and registration of the *bel canto*-trained singing voice, to define ideas and the interaction among ideas, with an ability far beyond even customary Classical poetry. Classical instrumental music is performed by instruments singing *bel canto* under the control of the capable performing musician.

Classical drama is never arbitrary fiction, but is always a medium for use of paradox to bring into focus some principle of actual history. As for Classical Greece, the dramas of important writers, such as Shakespeare or Schiller, were never fiction, but were historical studies of principles of statecraft referenced to actually known history, or to legends, such as the Homeric, which expressed a reflection on some period of history in a way relevant to current problems of statecraft.

As Shakespeare's Chorus steps forward to describe the play, *Henry V*, about to begin, he says:

For 'tis your thoughts than now must deck our kings,
Carry them here and there; jumping o'er times,
Turning the accomplishment of many years
Into an hour-glass. . . .

In successful Classical drama, the matters on stage fade, like the smile of the fabled Cheshire Cat, and the parts being performed on stage give way to the reality being enacted on the stage of your imagination. And if the play were well performed, you are astonished at the close, to see the actors standing still on that other stage before your eyes. If you are wise, and the play were well composed by author and the company, what you have experienced in your imagination, is

not a fiction, but a true insight. The fiction is the illusion which appears on stage when the play has ended; those actors there, are not now what they seem to be. Such, are matters of cognitive substance and sensory shadow.

All Classical art has the form of play: play in the double sense, of playing and drama. Its function, as play, is to evoke a study of matters of principle, as paradox is used for the teaching and progress of mathematical physics. Discovery of principle, is intense work, as adequate performance of a musical composition is. But it is always dependent upon a spirit of playfulness, and richly exciting to the committed participant. It is always, in that specific sense, *fun*. A person who is not playful in that sense of the term, is going cognitively dead, as too many university graduates do, about the time they pass through the unhappinesses of orals, written examinations, and securing their employment in their chosen career.¹⁹ A man who considers himself already perfected, is already cognitively dead.

The physical progress of humanity is expressed in the form of accumulated discoveries of universal physical principles. The comprehension of history is accessed through science's partnership with progress of discovering and applying the principles of Classical artistic composition to the understanding of the passion on which society's cooperation in use of science depends.

Health-Care as Infrastructure

The fraudulent argument, of Rachel Carson and others, for banning DDT, led to the present situation in which West Nile Virus threatens the U.S. population today. Sanitation and health-care are inseparable partners in the defense of human life. If we do not restore DDT to use now, we as a people, and its government, are morally insane. The overriding authority of the Preamble of the Federal Constitution demands a return to the governmental policies of sanitation and health-care of the 1960s, such as the post-war Hill-Burton law. It demands a return of the legal authority for diagnosis, prescription, and treatment to medical professional, now. The law of sanitation must be to contribute to preventing the spread of the sickness, and of health-care, to allow the physician to treat the patient.

The policies expressed by National Security Advisor Henry A. Kissinger's mass-murderous 1974 National Security Study Memorandum 200 (NSSM-200), and National Security Advisor Zbigniew Brzezinski's kindred, 1981 *Global Futures* and *Global 2000* policies, must be reversed, on both the grounds of the Preamble, and according to the implied obligations of the post-war Nuremberg Code. Human beings are not human cattle, to be herded and culled at the pleasure of the self-anointed "shareholder" interest.

At about the time Kissinger was issuing NSSM-200, my

associates were presenting a research report on the calculable consequences of continuing the global trends resulting from the policies which utopian plotters Kissinger, George Shultz, and Paul Volcker set into motion, as President Nixon's ruinous monetary policy of August 15, 1971.²⁰ In our own report, which was the result of a study-project which I had set into motion during Spring 1973, we pointed to the likelihood, that if then-current U.S. policy-trends of the 1971-1974 interval were continued, we would witness a massive, early- to middle-1980s, epidemic eruption of then still relatively dormant pests and diseases in areas such as the Sahel region of Africa. During the early 1980s, it happened, as our 1973-1974 work had forecast.

Today, we must not overlook the fact that the evolution of the HMO-dominated system has been significantly shaped by the intent to cull the American "human herd," by means akin to Adolf Hitler's elimination of lives deemed by him "not worthy to be lived." Like the NSSM-200's intent to promote genocide in places such as Africa, we have the promotion of euthanasia in the U.S.A., as in the Netherlands and Belgium. "No code" is a related part of this. The use of "malpractice" suits, creating the pretext for insurance companies' driving physicians, financially, either into restricted practice, or out of the profession, has been part of this. Current trends toward "one standard disease, one standard treatment—and no more!" is part of the process of accelerating mortality rates. Pricing pharmaceuticals out of the range of ever larger portions of our senior citizens, and of others, is part of this. The creation of the pre-conditions for widespread food shortages, is part of this.

Now, under the impact of the floating-exchange-rate monetary system, with legislation such as the predatory U.S. HMO law, with the rampage of deregulation unleashed under National Security Advisor Brzezinski, by Garn-St. Germain—implemented by the Keating Five—by Kemp-Roth, and by the financial-derivatives bubble, the destruction of those safeguards of sanitation and health-care has already taken on the character of a more or less global mass-murderous effect. The legendary Four Horsemen of the Apocalypse must be prancing triumphantly, when they see the continuing folly of most of our governments and their people.

The central feature model for a national health-care system, is, like the system intended by the Hill-Burton law, the application of the system required for support of a U.S. military at war. Under Hill-Burton, the unit was the county. The private and other physicians were rallied around a set of private, voluntary, university, and public hospitals, which represented what was estimated as an adequate bed-capacity of various classes, representing hospitals and auxiliary facilities for both expected and, to a significant degree, exceptional situations. This array of capabilities was buttressed by the

19. Cf. Dr. Lawrence S. Kubie, *The Neurotic Distortion of the Creative Process* (Lawrence, 1958), and "The Fostering of Scientific Creative Productivity," *Daedalus* (Spring 1962).

20. *New Solidarity*, Jan. 9 and 16, 1974, "Rockefeller's Ecological Holocaust."

functions of the Corp of Engineers, the Public Health Service, and the reserve which could be drawn from the military medical institutions. To the degree this development progressed in the respective states and counties, and to the degree in-time access to emergency hospital facilities was built into the public highway and transport systems, it worked; whereas HMO has been increasingly a failure. HMO law is not merely an inevitable failure, now becoming a national catastrophe; it is a predatory medical malpractice performed by shareholder value.

We must reverse the presently continuing, disastrous course.

Among the principal changes to be made, we must end the worsening trend toward basing the financial system of health-care on that usurious illogic, of using case-by-case accounting as an instrument of accountants' financial control of the medical practice, respecting the functions of diagnosis and care for the individual patient. It is ultimately as injurious to the U.S. national interest, to regulate the delivery of medical service on a patient-case by patient-case basis, as it would be to provide public sanitation for the sole benefit of one residence, but not the adjoining ones. My neighbor's disease is a disease of our neighborhood, or like epidemic contagious disease, or pollution, a disease of the nation as a whole. Health-care for a society is a matter of national-security interest.

The delivery of health-care by the medical profession is "entrepreneurial" in respect to its most essential characteristic: the application of the developed creative mental powers of the individual professional; public-health policy is a matter of the interdependency of the universal and particular role of the professional. *The provision of available health-care is universal; the professional care for the patient, is a privileged action by the relevant individual professional's direct relationship to the patient.* The arrangement under which quacks, guised as financial executives or accountants, engage in the malpractice of medicine, must be ended, and banned from future recurrence.

The leading edge of the process of rebuilding our national health-care system, will be the emphasis of public effort, by the Federal and state governments, on buttressing existing full-service general hospitals, and reestablishing them where closures of essential such institutions have occurred. Full-service general hospitals which function as teaching institutions, are crucial. Such an emphasis on general hospitals, and enhancement of their relations with the related research functions of universities, will provide the technological lever of reconstruction of the nation's health-care potential as a whole.

On the financing of health-care, we must return to the pre-HMO system. Health-care as a whole, is a bulk-purchase, not a retail sales outlet. The forecast payments from private patients, and from those under insurance or related programs, must be supplemented by the combination of contributions to hospital budget-requirements, and also capital improvements, by fund-raising, with contributions from agencies of

government as that last-resort amount which enables the institution to meet the requirements of relatively indigent patients.

3.0. A National Infrastructure Policy

Today, under the implied reading of the U.S. Constitution by Treasury Secretary Alexander Hamilton, government-directed building and maintenance of basic national infrastructure, should represent approximately half the economic throughput of the U.S. national economy. To reestablish a healthy national economy, we must understand and accept the functional basis which defines that relationship between basic economic infrastructure, as primarily the economic function of government, and the particular role of individual, private economic, or related initiative.

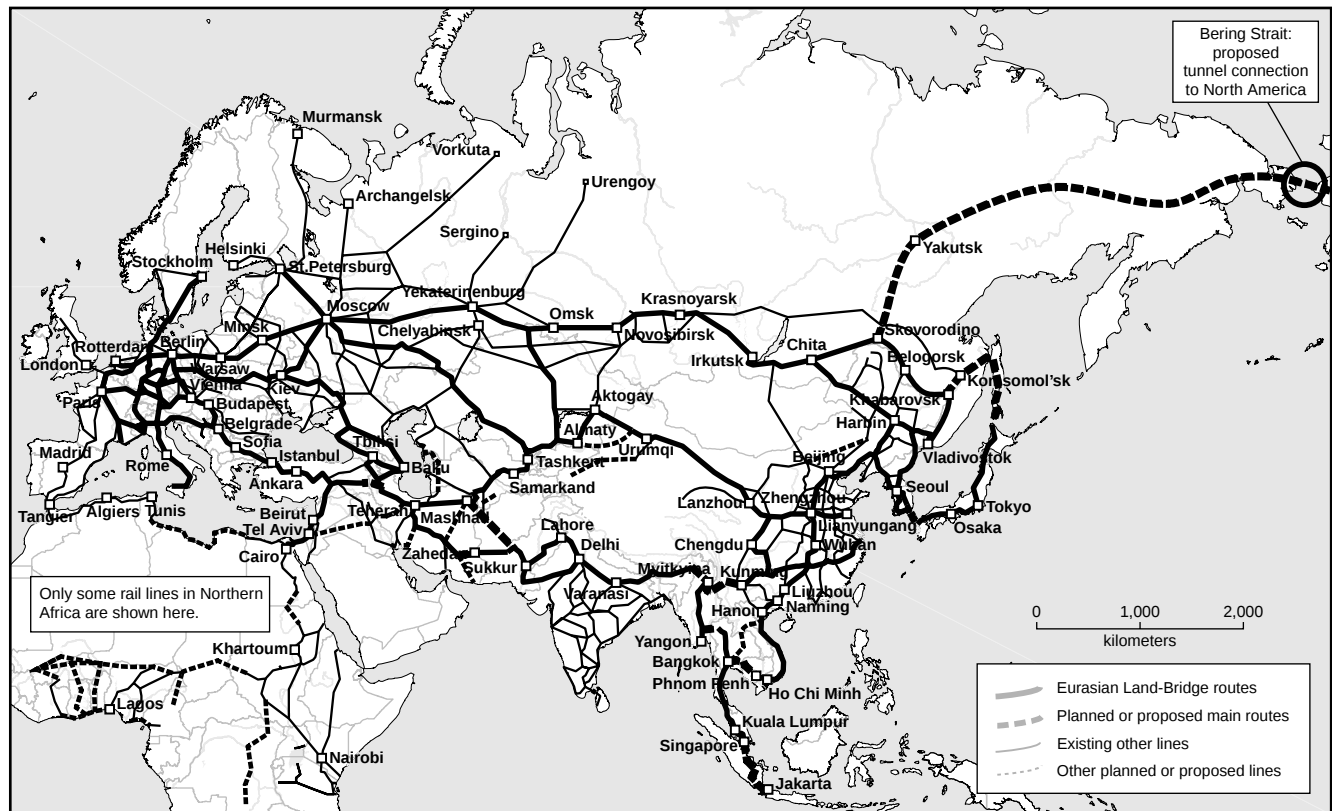
Admittedly, today, to achieve and maintain such goals, we must reverse the past three-decades shift in composition of the U.S. labor-force, to emphasize an increase in the ration of employment in technologically progressive physical output, a shrinking of unemployment, and a curtailing of dubious employment in such make-work activities as unskilled personal services and redundant aggregates of sales employment. This change in composition of employment of the labor-force, must be accomplished through increasing emphasis on increased capital investment in production of physical goods, per capita of the total labor-force. That means increase of physical capital, as distinguished from merely financial capital. To rebuild production, we must, like President Franklin Roosevelt, lay the foundation for that, by a relatively massive concentration on rebuilding basic economic infrastructure. We must build our way out of the current bind, in this two-fold manner.

The essence of healthy politics, is the role of the sovereign initiative by the individual personality. As such among our founders as Cotton Mather and Benjamin Franklin emphasized, the essential basis for a healthy republic, is the shared commitment among sovereign individual personalities of *the intention to do good*. To this end, moral individuals create and shape the government of their republic, and entrust to that government the authority and duty to make such laws as are needed to foster cooperative intentions, or to conduct such necessary operations as are beyond the competent authority and scope of private individual economic action. This authority and obligation requires us to conduct common and related action to secure the sovereignty of the republic's powers to promote the common good, and ensure those powers, commitments, and benefits to our posterity.

Individual freedom does not tolerate anarchy, nor anarchy individual freedom. As our Solar System, like the movement of our planet, is governed by those *intentions* defined as universal physical laws, the enduring freedom of the individual,

FIGURE 7

The Northern Rotterdam-Seoul-Tokyo Land-Bridge Corridor



Current actions by the Koreans, Japan, China and Russia are moving the northernmost of the three Eurasian Land-Bridge corridors—the “world’s longest railroad” from Rotterdam on the North Sea over the Trans-Siberian, down through the Korean Peninsula and over to Japan—closer to fruition.

requires that our free choices be governed by adoption of and submission to an appropriate choice of orbital trajectory for our society, as a whole. If we err, we shall correct our error. To this end, a republic must regulate the economy as a whole, to protect it from the follies of some or more of its own citizens, as from foreign errors which might spoil our national intention. In addition to those protectionist rules set forth by leading American patriots, such as Benjamin Franklin, Hamilton, Monroe, the American Whigs, Friedrich List, and Franklin Roosevelt, they showed that government must change the environment in ways which enable the common action of individual producers, to increase the productive powers of labor of the republic as a whole.

The primary responsibility of government for basic economic infrastructure, is among the principal vehicles to be used by government for its functions of protectionist and regulatory measures in shaping the direction of the U.S. economy. In the state of affairs associated with today’s combined national and world crisis, concern for our nation’s own infrastructure must now also figure, to a greater degree than ever before, in our nation’s long-range foreign-policy.

U.S. Global Infrastructure Policy Today

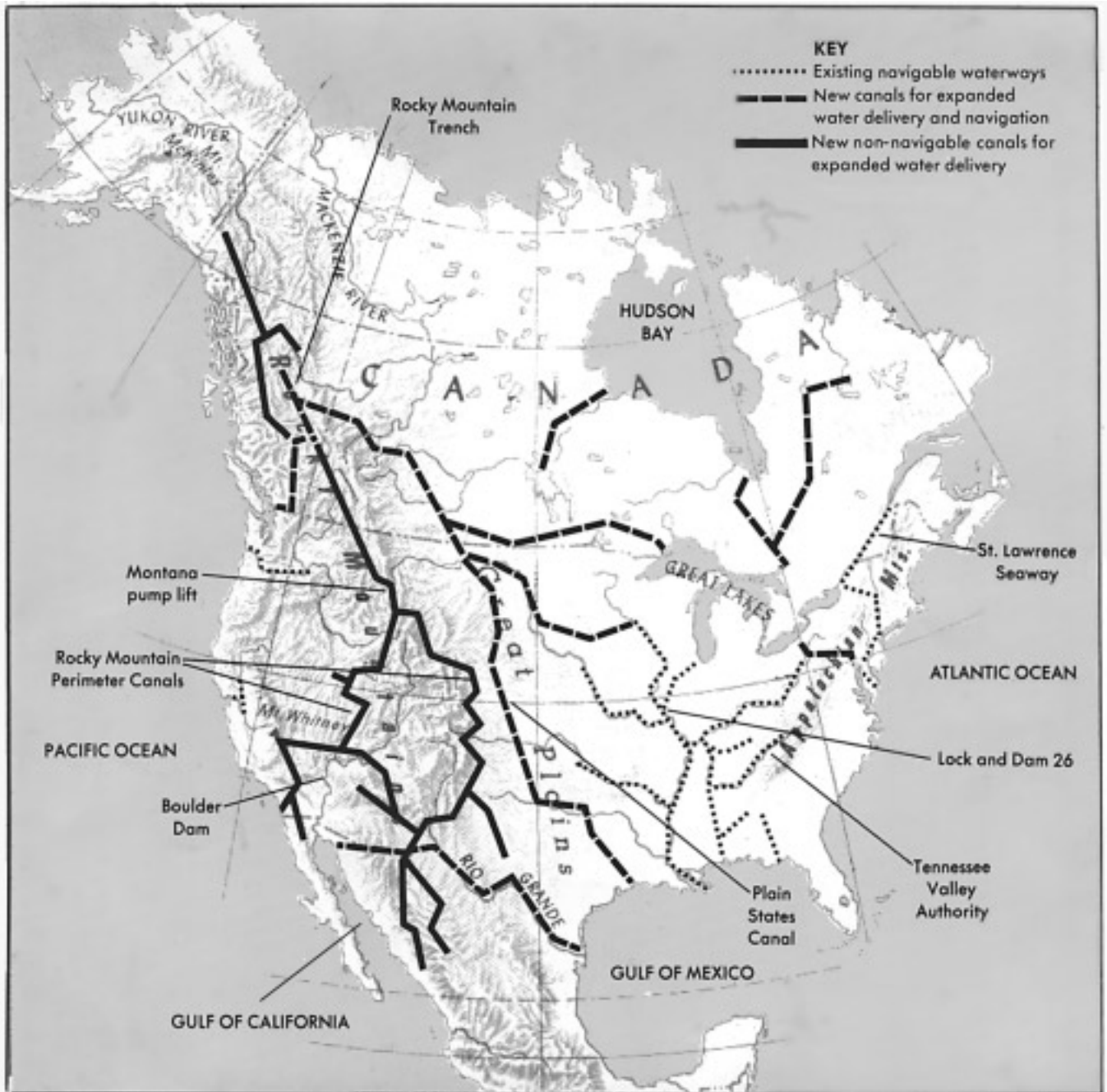
The U.S. system of infrastructure must be assessed as dovetailing with a now emerging global system of multi-continental economic-development corridors.

The spines of these corridors are defined by a combination of continental systems of blended friction-rail and magnetic-levitation transport, and water-corridors used for combined functions of extended inland waterways for transport, and for land-management—as for agriculture and human consumption of water. These corridors parallel the transport-lines with large-scale systems for generation and distribution of power and, often, distribution of water through pipelines. The corridors, which may be in the order of fifty to a hundred kilometers in cross-section, will incorporate presently existing or new urban centers, which will be linked to secondary urban centers within the same beltway.

In the case of one of these corridor-networks, the Eurasian Land-Bridge linking Pusan and Japan to Rotterdam (Figure 7), the included mission of these corridors, is to transform corridors running through large regions of Central and North Asia, into regions of development through which efficient

FIGURE 8

The NAWAPA Plan for Bringing Additional Fresh Water to the United States, Canada, and Mexico



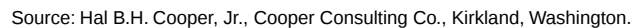
The North American Water and Power Alliance project, on the drawing boards since 1964, would provide a 20% increase in water supply to the United States, while making additional water available to Canada and Mexico.

access to the development of mineral and other resources becomes economically feasible. Thus, the transport of technology, from “fountains” of technological progress throughout Eurasia, to regions of Asia which have presently a large deficit in such capacity, defines the principal lines of future

world trade throughout the interior of Eurasia as a whole.

In North America, the need for a nationwide water-management program, such as an expanded North American Power and Water Alliance (NAWAPA), implies a unified rail-water grid-system reaching, through cooperation among

Proposed Inter-American Railroad Line

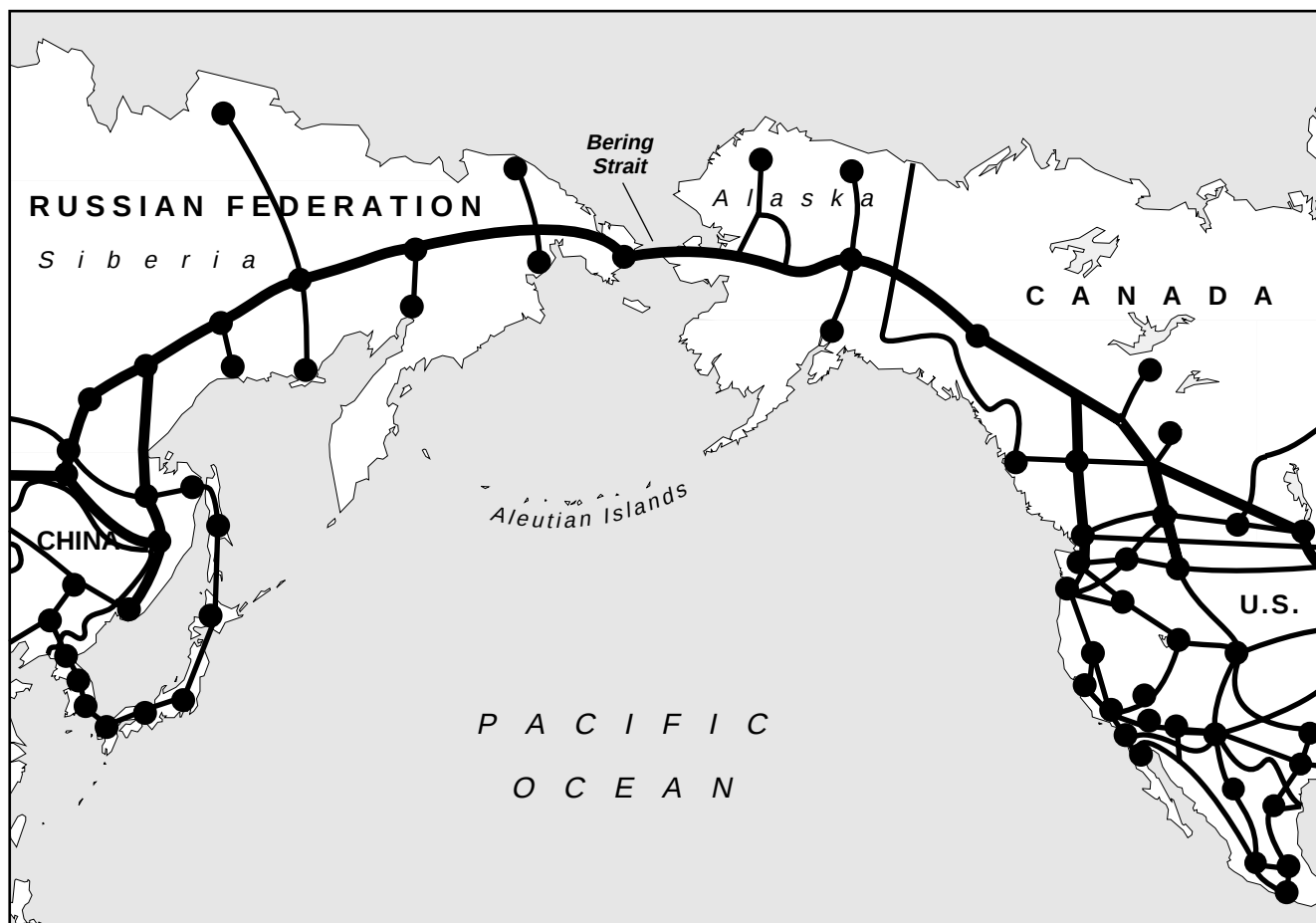


The Eurasian Land-Bridge system is to be linked with systems of the Americas through a rail/maglev link across the region of the Bering Strait (**Figure 10**).

Political Economy 41

FIGURE 10

Bering Strait Tunnel Connection for Rail Corridors



Source: Hal B.H. Cooper, Jr., Cooper Consulting Co.

through Central and South America (**Figure 11**). Within South America, the combination of wide-scale rail/maglev and water management systems, have an outstanding included importance, in doing for inland South America what the Eurasian Land-Bridge makes possible for Central and North Asia.

The Southernmost tier of the Eurasian Land-Bridge system enters Africa at Egypt, through a great railway bridge soaring above, and spanning the Suez Canal (**Figure 12**).

Within such a global grid of development corridors, the nations enter into a new phase of history, in which cooperation in effectively managing the Biosphere becomes as feasible as it is indispensable.

Our Space Program

However! The habitable portions of our planet occupy a relatively small, if crucially significant part of the planetary body as a whole. Moreover, the planet as a whole, including

its surface areas, are also subject to powerful influences exerted, not only by patterns of behavior of the Sun itself, but the Solar System as a whole. We have come into a recently new phase of human existence, during which we must now think seriously of space exploration as an essential part of the world's, and, therefore, our nation's essential economic infrastructure.

The known catastrophes heretofore suffered by peoples, have fallen into two classes,²¹ man-made, and from so-called "natural" causes, the latter usually presumed, in earlier times, to be beyond man's power to prevent. As physical science progresses, we begin to imagine that we can either control some of the forces behind so-called "natural" catastrophes, or, in other cases—such as architecture for earthquake zones—at least mitigate the damage suffered. Also, through scientific progress, we become aware of new kinds of threatening long-

21. Cf. Plato, *Timaeus*.

FIGURE 11

South America: Great Water Projects



Modern civilization's technological progress has depended upon exploring in three directions: outward, into the astrophysical domain; inward, ever deeper into microphysics; and, toward the extremes of what is loosely termed "energy-flux density." It is sufficient, for the purposes of this report, to offer one illustration of this point, the matter of life.

As I have indicated earlier, the physical proof that life expresses a principle absent from our definition of abiotic processes, argues that the principle which life expresses is universally efficient. Therefore, are there fossils on Mars which attest not only to fossils of earlier life on that planet, but some active form of life today? This requires a multi-planetary experiment. To conduct that experiment in an adequate way, we must use probes, but we must, sooner or later, actually visit it.

Consider this matter from the vantage-point of my earlier, qualified emphasis on the conception of the Noösphere. The requirements of development along the lines indicated by the accompanying figures showing development corridors and waterways developments, represent global undertakings, with global effects. We know enough in advance to be assured we can be successful in the explicitly stated intentions behind such plans. Nevertheless, we must also look ahead to consider the challenge of managing the long-range, global effects of what we are building. We must consider the Earth's own Noösphere within the Solar System of which it is a part, especially that inner ring of Sun and planets within which the Earth's own Noösphere is functionally situated. For this purpose, we must also look at our Earth from relevant viewpoints in nearby space.

I refer to a proposal for a Mars-oriented space program, which I developed, in memory of Krafft Ehricke, during 1985-1986. A reflection of that proposal was presented in a half-hour television documentary, "The Woman on Mars," which I broadcast in 1988. During those years, I concluded that *such a long-range program*, for placing a permanent science station, exchanging personnel by means of continuously powered flights of flotillas of partially Moon-manufactured spacecraft between Earth-orbit and Mars, should define the mis-

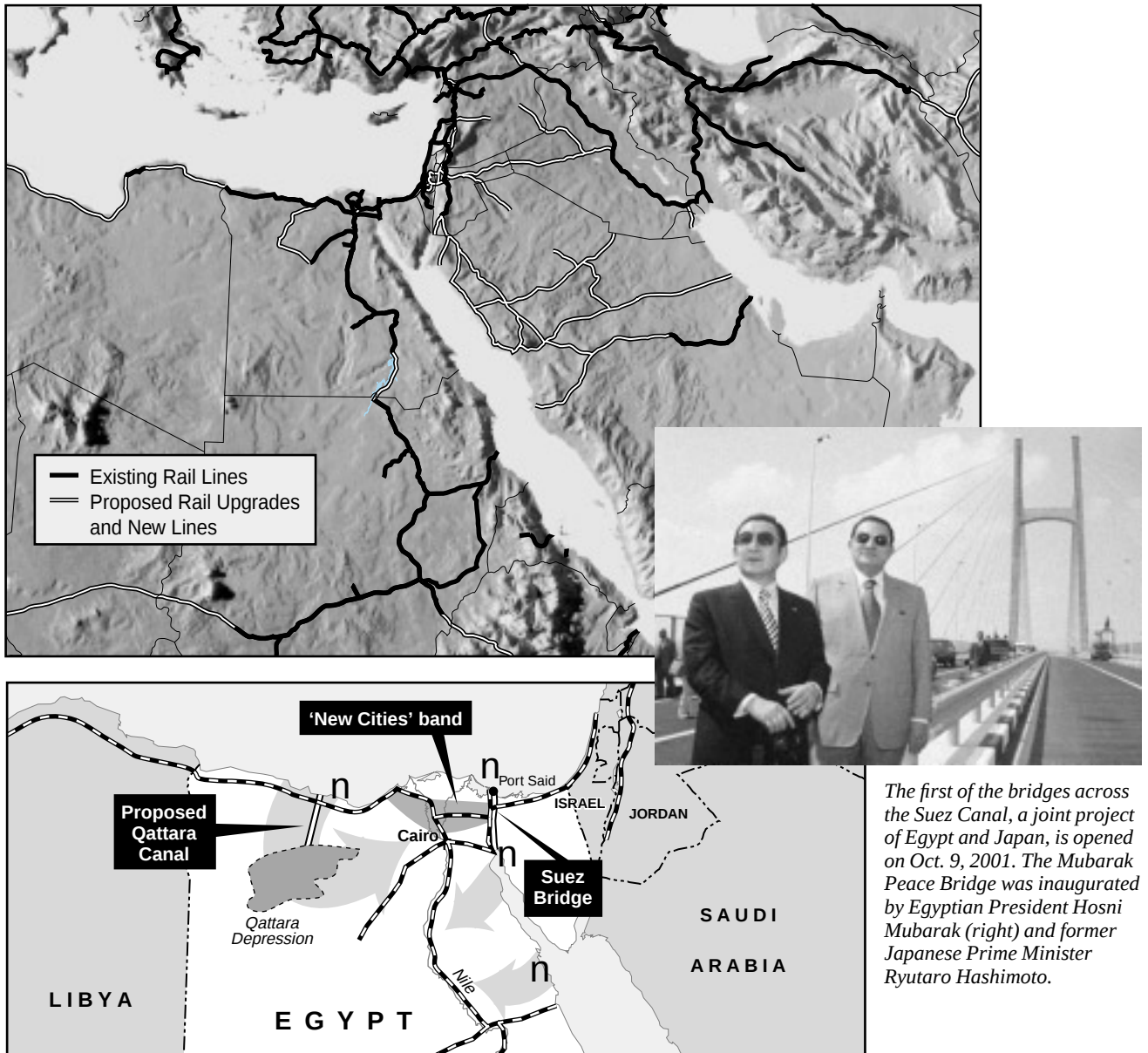
wave natural effects built into our Solar System, or perhaps from beyond. The sense of those dangers from natural extra-terrestrial cycles, gives us a fresh sense of the frailty of the system of human life on Earth. Scientific progress provides the grounds for optimism about mankind's emerging power to gain control over these dangers.

Shall we then say to ourselves, "In a few billions years, or much less, human life on this planet will be crushed"? What of a large asteroid hitting Earth directly? So it goes. Shall we, then, resolve to squat pitifully on the surface of our planet, or shall we get out "there," seeking the knowledge by whose aid future generations might defend our planet from such things?

There are other, if related reasons for space exploration.

FIGURE 12

Greater Middle East, Existing and Proposed Rail Development (Arab League)



The first of the bridges across the Suez Canal, a joint project of Egypt and Japan, is opened on Oct. 9, 2001. The Mubarak Peace Bridge was inaugurated by Egyptian President Hosni Mubarak (right) and former Japanese Prime Minister Ryutaro Hashimoto.

sion-orientation of the organizational umbrella of our national science-driver establishment. Implicitly, virtually all of the frontier development and pilot implementation of scientific discovery would be situated with the greatest efficiency, in a organized effort built around a space-oriented mission of discovery and pioneering development.

Such a space-exploration program is no mere option.

As I have emphasized, once again, within the foregoing pages, man's ability to increase our species' per-capita and per-square-kilometer power on our planet, depends, unconditionally, upon the efficient intention to promote and rely upon

progress in discovery and application of valid notions of universal physical principle. As we progress, both the possibility and urgency of accelerating such progress are increased. To that purpose, we must choose one or several possibilities for achieving broad-based breakthroughs, each such loosely describable as a field of scientific breakthroughs.

The space-exploration mission-orientation which I have indicated fits such a requirement for the world's present level of its scientific-technological frontiers. A fuller appreciation of the implications of the concept of the Noösphere, points us in that direction.

As I emphasized in the report sampled by my 1988 nationally televised “The Woman on Mars,” any sensible scheme for man’s scientific visits to Mars, must be a long-range effort, for which about forty years of development must be expected. The requirement must be flotillas of spacecraft, whose weightiest components will be produced from materials available on the Moon (including, probably Helium-3 fuel). These journeys will be made as continuously powered (accelerated, decelerated) flight, from a base in Earth’s geo-stationary orbit, to a position orbiting above Mars. From materials in the latter position, assemblies will descend to the surface, and subsurface of Mars, thus establishing a station to receive and provide protective housing for working teams. This will require the development of technologies now known to be feasible accomplishments, but not yet available otherwise.

Although, back in 1986, I allowed about forty years for the completion of the initial manned-flight mission of the project, even allowing forty years means attacking the problems as a high-intensity “crash program” roughly broadly comparable to President Kennedy’s Moon-landing mission. However, that does not mean that the pay-back begins forty years from now. Each and all of the technologies required for that mission, will be applicable ways of bringing great benefits to life back here on Earth. We need not wait the forty years for such benefits; we will be able to apply some of them to life on Earth in the years immediately ahead, and others at later stages of the initial program. As I emphasized in 1986, if we can design housing for a scientific station on Mars, we have thus the quality of technology needed to transform the Sahara.

Look at the U.S. Moon-landing program, which brought many times the cost of the program as economic benefits to our national economy. Science-driver modes of “crash programs,” have been relatively the greatest source of progress in the productive powers of labor.

I emphasize my warning. In the universe, nothing good simply happens. The notion of universal physical principles can not be competently separated from intention. Without a will, there is no way. In general, it is the efficient intention to do good which creates and maintains a good society; it is persons committed to do good, who protect societies against the doom of decadence. Never trust programs, except as they express the unswerving intention built into the relevant political or other personalities. To save our imperilled nation, our imperilled planet, we must develop the institutions, including science-driver types of “crash programs” which are relevant to an intention for progress as such.

3.1. The American System of Political-Economy

As I have said repeatedly, here and in many earlier locations, *the creation of the U.S.A. as a sovereign republic, is a*

unique event in the past half-millennium of world history. During a time when it was still impossible to establish a true republic in Europe, the best minds of Eighteenth-Century Europe rallied to the hope of the establishment of such a republic from among the English-speaking colonies of North America. The exemplary result of that process, was the role of the energetic scientific and political genius of Benjamin Franklin, in steering his followers through the perilous 1763-1789 struggle to establish a Federal constitutional republic premised on the principle of *agapē* (the common good, the general welfare). As our friend, the Marquis de Lafayette expressed it, the newborn U.S. republic was a temple of liberty and beacon of hope, for all mankind.

The celebrated. London-orchestrated events of July 14, 1789 sealed the defeat of the effort of Bailly and Lafayette, to rescue France from its deadly crisis. They created a constitution which they had intended should transform France quickly into a constitutional monarchy echoing the draft U.S. Constitution. A break between the U.S.A. and its former ally France, was accomplished under such influences as British Foreign Office agents Danton and Marat, a break deepened by the London-steered Jacobin Terror, by the Napoleonic tyranny, and, then, by the Devil’s own Congress of Vienna. These ugly events left the young U.S. republic imperilled throughout the ensuing period, until the crucial military victory of 1863 at Gettysburg. Throughout that period, from the Duke of Wellington’s successful seating of Britain’s puppet, France’s disgusting Restoration monarchy, on France’s throne, France, Britain, and the Habsburgs, and the Spanish monarchy, among others, were our enemies, through and beyond 1865: until those U.S. military victories of 1863-1865 which led to the expulsion of the fascistic puppet-regime of the tyrant Maximilian, which London and Napoleon III had imposed upon Mexico. By the role of leaders such as the American Whigs, such as President Abraham Lincoln, our republic survived, to emerge as a world model of agro-industrial development during the 1861-1876 interval.

During the perilous early decades of the emerging republic, 1763-1865, including the “four score and seven years” preceding the Battle of Gettysburg, the treacherous American Tories enjoyed the sympathies, and also support from our British and other enemies based in Europe. Under these difficult circumstances, the U.S. interior had become a battlefield between two forces: the American Tories, such as bankers Aaron Burr and Martin van Buren, controlled chiefly from London; and the patriotic tradition associated with the Whigs, Lincoln Republicans, and President Franklin Roosevelt’s Presidency. That conflict persists to the present day.

As a consequence of that yet-unresolved internal conflict between the forces of good and evil—and, notably, because of the political conditions which developed during the post-Franklin Roosevelt decades—virtually none of our universities’ economics, history, and political science departments today acknowledge, or even seem to know of the axiomatic, systemic distinctions between that American System of polit-

ical-economy implicit in our Federal Constitution, and the model, often called “capitalism,” established in Britain under the British East India Company and its Haileybury school of Bentham, Adam Smith, Malthus, Ricardo, et al. Still today, the political processes of our nation are polluted with the incompetence expressed by the often-babbled lie, that the U.S. Constitution is a testament to British Eighteenth- and Nineteenth-Century liberalism.

Again, as I have emphasized in these pages, the economic policy-shaping of today’s U.S.A., is divided between two conflicting, axiomatically incompatible systems, the American System and its opponent, that presently extremely decadent form of the British Eighteenth-Century system. The irony is, that we have been invariably brought to the brink of ruin, as now, by the varieties of that British liberalism which President Franklin Roosevelt denounced, and the liberalism from which we were repeatedly rescued, as from the brink, by a turning back to the American System, as the case of President Franklin Roosevelt illustrates that point in practice.

Therefore, the principal intellectual obstacle to saving our republic from ruin, is the lack of competence in the economic opinions of not only most within our government and leading parties, but the citizenry in general. Unfortunately, only the smell of doomsday in the presently accelerating, global monetary-financial collapse-process, could shock parties and constituencies sufficiently to cause them to consider rethinking their recent opinions about the principles of economy. That shock is being delivered with increasing force right now.

To understand that conflict, we must look back to its roots in pre-Treaty of Westphalia Europe, in that period of a post-Renaissance, little dark age of Venice-orchestrated religious warfare in modern Europe’s history, from 1511 to 1658.

Out of the Seventeenth-Century developments in England and the Netherlands, two varieties of tyranny emerged as leading powers in Europe. One, was typified by the advocacy of that absolutist, Hitler-like tyranny associated with Paolo Sarpi follower Thomas Hobbes. The other, that pro-slavery form of oligarchical tyranny more reflective of the tradition of Venice’s financier oligarchy, was that of the followers of William of Orange and John Locke. As Irish recollection insists, there is, of course, no genetic difference between the brutishness of Hobbes and the Mephistophelean liberalism of Locke. The two are, like the slime-molds, two seemingly opposite appearances of the same species expressed in the form of what are merely alternating states of organization. In both political systems, the Hobbesian and Lockean, the oligarchy conceives of itself as a Cathar-like “elect,” or “select.” Under Hobbes, there is a dictator. Under Locke, the oligarch’s hedonistic exercise of political and economic power, is typified by the principle of the slime-mold-like central banking system, a collective parasite which herds, loots, and lulls and culls the common herd of human cattle.

The more liberal approach to pillaging the poor, that of the followers of Locke and his like, usually prefers to rely

chiefly on a combination of financial power and rigging the game of financial affairs greatly in favor of “the house,” or the squabbling “houses,” which are almost as much predators in their dealing with one another, as with their customary popular prey. They dispense their pillaging *liberally*.

The most concise expression of the axiomatic distinction between the American System and the axiomatic quality of the Eighteenth-Century British East India Company model of imperial financier-oligarchical maritime power, is the difference in policies of education.

The British Eighteenth- and Nineteenth-Century liberal model prefers not to cultivate “excessively” the mental powers of young members of the human herd. It prefers to degrade the mental powers of the many into a condition which the rulers have selected for each victim as his or her destined, future economic role and station in adult life. That tradition, which is an echo of the Roman imperial Code of Diocletian, and its echoes in U.S. educational policy-making today, measures education in terms of estimated fitness of the young for adult employment, as if one were expressing deep moral concern for the production of wool and meat, not human beings.

Our American patriotic model rejects that. The difference is reflected in the relative literacy of the two populations at the beginning of the Nineteenth Century. The level of literacy in Benjamin Franklin’s America, was more than twice that of the British. Our republican education policy, as expressed by Benjamin Franklin’s leadership, was always consistent with what German history should recall as the Schiller-Humboldt mode of Classical humanist education. Our tradition in education-policy, is the development of human beings, rather than households of employable human cattle.

If we are true republicans, we develop the economy and its opportunities for employment, in directions intended for the needs of human beings, rather than degrading human beings, as if there were wood or bone to be carved into the shape of employees. Since it is natural for human beings to be cognitive beings, we must require our economy to develop in directions of that scientific and related progress which expresses the essential distinction between human nature and the beasts. We must educate all of our young to become makers of a history of progress of the human condition, rather than species of human cattle.

In the great sweep of that European civilization, rooted in Classical Greece, which was originally the child of Egypt, the Classical humanist tradition has always been expressed as a struggle: first, to discover human nature and its requirements less imperfectly; and, second, to steer the process of change within society in directions which are compatible with the natural requirements expressed by the human power to discover, transmit, and apply discoveries of those universal physical principles of art and science, by means of which the human being acts as one made in the image of, and love for, mankind and the Creator alike.

Under such a policy, we do not foster technological progress for the sake of becoming rich; we choose technological progress as the way in which the living individual, caught between the brevities of individual life and death, can find a meaning of an individual life's work which shall become a necessary, useful part of the future of humanity. The dying man must smile, because he knows his life was not a waste; he must live and die, not as a pet or cattle do, but according to that essential nature of the human being which wise men know as a creature made in the likeness of the Creator.

The great scientist must be paid, but pay is not his motive. Rather, he must be paid because he must be enabled to do that work on which his contribution to future mankind depends. He must be paid such that his family and community will continue an upward course of human development. He must be educated for that role, the all-sided role which every person in a just society must be educated to perform.

The axiomatic root of the difference between the American System and Eighteenth-Century British liberalism, is that.

3.2. Infrastructure and Profit

Competent policy-shaping of a national economy treats the concept of financial capital as a fiction. To understand any of the essential mechanisms of a national, and world economy, we must rely on the notion of physical capital, rather than financial capital. In addition to the physical capital essential to production of products and essential services, we require, absolutely, two other categories of physical capital which are usually overlooked in recent decades of official and other U.S. estimates of national income and product. This defect in U.S. official accounting already existed even before the early introduction of the fraud known as the Quality Adjustment Index, during the early years of Paul Volcker's Chairmanship of the Federal Reserve System.²²

The two accumulations of physical capital which are, most often, either overlooked or greatly underrated, are governmental contributions to the development and maintenance of basic economic infrastructure, and the development of that artistic and scientific cultural development of the members of society which is to be best assessed by the comparative standards of strictly Classical culture.

Such infrastructure, like the capital development of the facilities of production of physical goods, performs an indispensable, if largely intermediate function in the relationship

between the exercise of the individual human will and the Biosphere in general. It is the tool which amplifies the application of the human will and hand. It does this in much the same sense as the investment in essential physical forms of capital goods in manufacturing or agriculture. The connection between such notions of infrastructural and industrial productions' capital, is relatively more immediate, more obvious in the case of modern agriculture. These connections are best understood from the standpoint of the Noösphere, as I have summarized my view of the Noösphere earlier in this report.

The concept is even clearer, at least implicitly so, when we look at the development of the mind of the individual as a form of stored-up investment in physical capital. The accumulation of cognitive knowledge of valid universal physical principles, as distinguished from mere forms of learning comparable to textbook learning, brings the essential point into better focus.

Thus, the recent three decades of madness, in destroying capital through privatizing public infrastructural institutions; in substituting "blab school" qualities of instruction in mere opinion, in most aspects of public and higher education; in reducing techniques more and more to techniques to be learned by dummies; typifies a vast, systemic process of destruction of physical capital of the landscape and human minds alike, as the case of "The Keating Five" illustrates the point.

If we take those horrors introduced during the recent three decades into account, there is nothing properly mysterious about the fact that our economy is sliding deeply into a physical, as well as monetary-financial collapse.

The complementary point to be stressed, is that production costs far more than present accounting practices allow. By reducing the acknowledged costs of education, for the sake of "the bottom line," accounting practice of the recent decades has contributed much to bringing our economy to the bottom we are now experiencing. The perilous collapse of our capacity for generating electrical power, the decay of our investment in large-scale water-management systems, the intentional looting of the national railway system, and what deregulation of transportation did to our national trucking and air travel industries, illustrate the point.

We must regard standards for minimum wages, pensions, freight-rate schedules, protectionist approaches to defining fair prices of essential produced goods, and maintaining a repertoire of national production of most of the types of essential goods for our own internal use, as, admittedly, increases of the apparent accounting costs of marketed goods; but those price-floors are essential to the formation of essential productive capital, including the basic economic infrastructure, and levels of cognitive mental development of our young.

After more than three decades of qualities of folly often verging upon insanity, or worse, it is time to correct those mistakes, and rebuild.

22. Recently, the fraud of the early 1980s Quality Adjustment Index has been continued under the accounting fraud of "hedonistic" valuation. This fraudulent notion of a "hedonistic" principle was introduced into late-Eighteenth-Century British practice by Lord Shelburne's Jeremy Bentham, the latter the putative father, and stuffed dummy, of the "utilitarian" school. It persists today as a reflection of the dogmas of John Stuart Mill and the "marginal utilitarians" generally.