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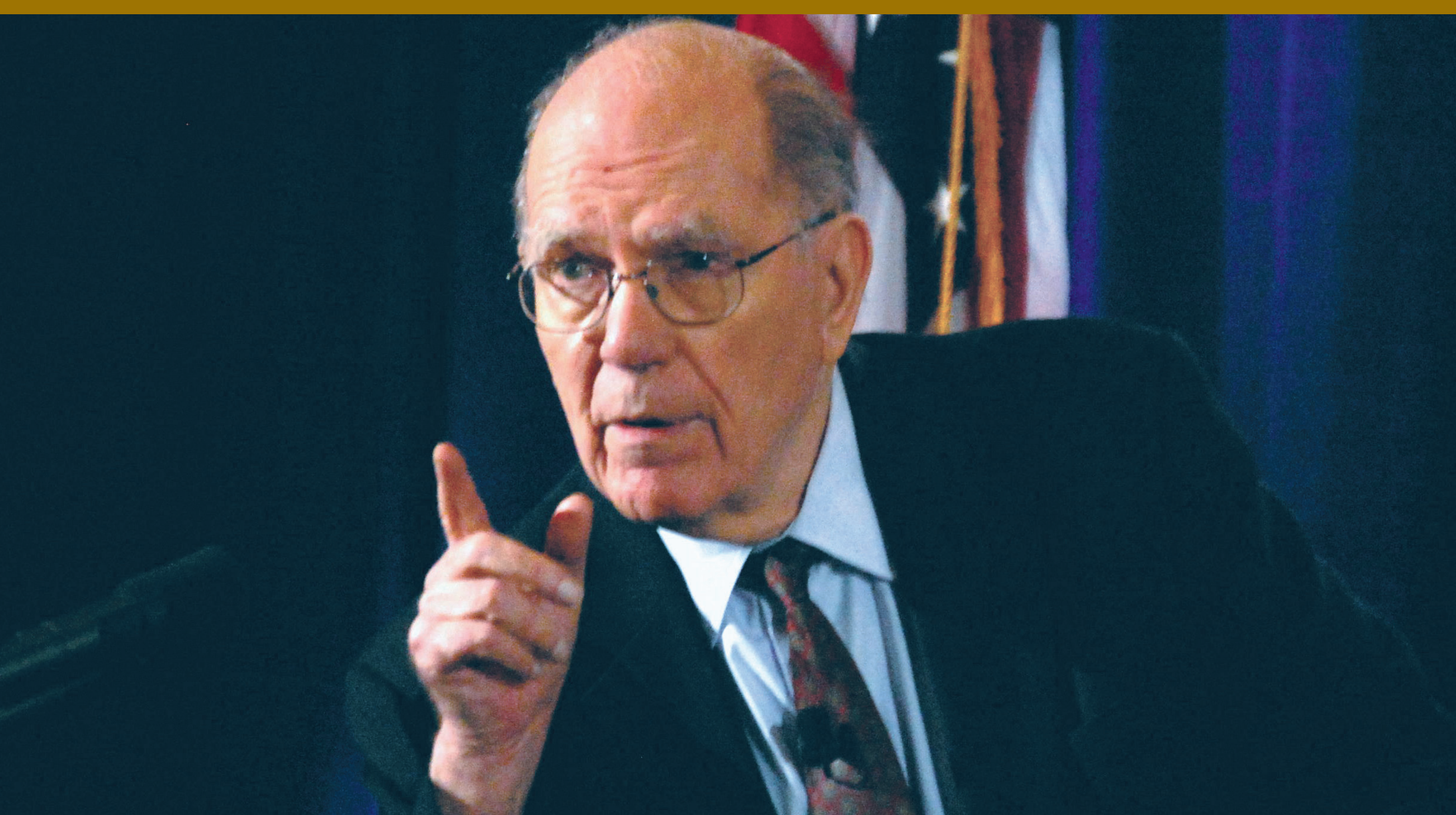
Face Economic Reality: LaRouche Was Right



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Face Economic Reality: LaRouche Was Right

EDITORIAL

Face the Economic Reality—LaRouche Was Right!

April 27—The United States and the trans-Atlantic financial system are right now plunging towards a financial blowout bigger than that of 2007-08. Today's corporate debt bubble, at $14 trillion, is bigger than the $11 trillion mortgage bubble of 2007-08, and the 20% level of defaults projected for these debts today, is far greater than that actually experienced in mortgages a decade ago. We are already into "The Big Short," where Wall Street is lending money to suckers to help them buy up its securitized worthless debts—and then betting against its own customers. (See page 8.)

The hysteria, exhibited in Wall Street's daily public freakouts against Glass-Steagall, reflects the banks' awareness of the coming blowout.

Nothing like the present situation has ever been experienced anywhere before. Put another way, nothing in the present world situation bears any comparison whatever even to that of the 2007-08 financial crisis, for example.

Consider another unprecedented moment in human history.

NASA Mission Controller Gene Kranz, who went on to be the key Mission Controller for Apollo 13, described in his book, "Failure is Not an Option," published in 2009, how his boss, the legendary Mission Controller Chris Kraft, had walked up to his desk just two weeks after Kranz had first joined NASA at Langley in 1960. Kraft said, "Everyone else is tied up. You're all I've got. We're coming up on our first Redstone launch. I'd like you to go down to the Cape, get with the test conductors and write a countdown. Then write some mission rules. When you finish give me a call and we'll come down and start training."

NASA/Adam Cuerden

NASA Mission Controller Gene Kranz.

"The shock on my face must have registered," Kranz wrote, "as Kraft continued, 'I'll tell Paul Johnson to meet you at Mercury Control and give you a hand.' When Kraft talked, his eyes never left mine."

"My days as an observer were over, my chance to get up to speed ended. . . . From my work, most recently at Holloman Airforce Base in New Mexico, I knew about flying, systems, procedures, and checklists. I could figure out what a countdown should contain. Mission rules were different. There had never before been such a mission in U.S. history—I would just have to give it a shot. Since there were no books written on the actual methodology of space flight, we had to write them as we went along."

And it is just so for us at this moment.

There is no book which tells us what we must do now.

We do know that the crash must be pre-empted by an in-depth mobilization of the population—just like a mobilization for war, but in this case, a mobilization for the economy in depth. The only approximating comparison is Franklin Roosevelt's "100 Days" program, and this time we will require the scientific precision expressed in the most successful of FDR's economic mobilization drives, perhaps best exemplified in the Tennessee Valley Authority, which is still considered a miracle for its time.

Lyndon LaRouche spelled out what this means in his "Four New Laws" of June 2014. That statement opens as follows:

> The economy of the United States of America, and also that of the trans-Atlantic political-economic regions of the planet, are now under the immediate, mortal danger of a general, physical-economic, chain-reaction breakdown-crisis of that region of this planet as a whole. The name for that direct breakdown-crisis throughout those indicated regions of the planet, is the presently ongoing introduction of a general "Bail-in" action under the several, or more governments of that region: the effect on those regions, will be comparable to the physical-economic collapse of the post-"World War I" general collapse of the economy of the German Weimar Republic: but, this time, hitting, first, the entirety of the nation-state economies of the trans-Atlantic region, rather than some defeated economies within Europe.
>
> A chain-reaction collapse, to this effect, is already accelerating with an effect on the money-systems of the nations of that region. The present acceleration of a "Bail-in" policy throughout the trans-Atlantic region, as underway now, means mass-death suddenly hitting the populations of all nations within that trans-Atlantic region: whether directly, or by "overflow."
>
> The effects of this already prepared action by the monetarist interests of that so-designated region, unless stopped virtually now, will produce, in effect, an accelerating rate of genocide throughout that indicated portion of the planet immediately, but, also, with catastrophic "side effects" of comparable significance in the Eurasian regions.

Mr. LaRouche continued the development of this thought in dialogue with colleagues recently.

> The United States and other nations have an intrinsic power of economy, as has been shown in super-high growth-rate impulses in certain periods, as with FDR, JFK, and in the industrial revolution based on Lincoln's policies.
>
> But then the thieves came and shut it down, and each time spread the myth that this, their speculative practices, is the way the system really works. That's a myth! It doesn't work that way. What we have to do is what the LaRouche PAC and the broader LaRouche movement is doing in the Manhattan region, i.e. awakening the souls of fellow American's, among others, through the beauty of the American System.
>
> We are actually creating a force of economic creativity. What we have done with the music, with the concerts, the choruses throughout the city, is an example of real economic creativity. What is required is the generation of a process of development. Then we do not have a real crisis, since the population is then the solution—not the problem. We may have an embarrassment. You may have lost money! You may have lost your job on Wall St., but the system itself, if treated properly, will work.
>
> It is time to support reality, and economic reality has to be installed. If in the face of this crisis, we install the proper reality, if we place value on that which has real value, the population, the future populations—then we don't have a problem. Then the gates of prosperity will open sooner or later. The problem in economies is when economies are being destroyed, as with our nation today, by the hand of the British and their Wall St. types.
>
> If you look at it the way I look at it, we have the gates of prosperity looking at us. But we've got to maintain them—that's the difference.

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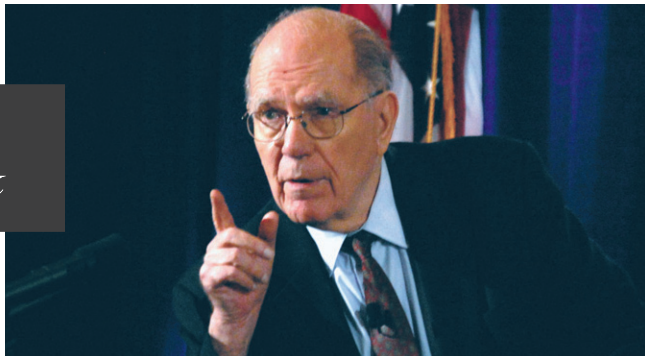
Cover This Week



EIRNS/Stuart Lewis

FACE ECONOMIC REALITY: LAROUCHE WAS RIGHT

I. The Struggle Against London

The Philippines Joins the LaRouche Movement's War on the *New York Times*

by Michael Billington

May 1—For years Lyndon LaRouche and the movement associated with him have identified the *New York Times* (know more familiarly as the *New York Slimes*) as the leading voice of Wall Street, the drug lobby (as identified in the *EIR* book, *Dope, Inc.*), the war party run by the Bush family and Barack Obama, and other similar evils—that is, as the voice of the British Empire in America. This identification has included many detailed reports in *EIR* of the crimes of the *Times*, as well as political demonstrations at its offices in New York against its many lies and crimes. We have modified the motto it carries on its front page: "All the Lies that Fit, We Print."

Philippines Presidential website

Philippines President Rodrigo Duterte.

Over the past week, the Philippine government of President Rodrigo Duterte and several leading intellectuals in the country have fully joined in that campaign to expose the lies and threats from the *Times* against the Philippines as criminal acts under both moral law and international law. This step was provoked by the *Times* editorial of April 25, titled "Let the World Condemn Duterte," a vile piece of imperial lying which should be considered a death threat against the President of the Philippines. The editorial reports on a scurrilous case presented to the International Criminal Court (ICC) by a Philippine lawyer calling for Duterte to be tried for crimes against humanity over his war on drugs. The ICC itself is an imperial institution, which tries Third World leaders almost exclusively, never the mass murderers and lawless warmongers of the West such as Tony Blair, George Bush and Barack Obama.

"The ICC should promptly open a preliminary investigation into the killings," writes the *Times* editorial board, referring to those drug dealers who have been killed resisting Duterte's all-out war on the drug scourge. Duterte's pledge to wage such a war on drugs was a major reason he was elected, and why he enjoys overwhelming support in his country today (polls show his support at somewhere between 78-90% among the Philippine people).

The *Times* admits that the case does not even meet ICC requirements, according to which all judicial efforts within the country must first be exhausted. There are multiple legal cases over the deaths in the drug war before courts in the Philippines, including some against police and army personnel whom Duterte has identified as complicit in the drug business and/or in extra-judicial killings, primarily to silence drug lords they fear would testify against them. The *Times* typically ignores that reality, as it also rejects the sovereign judgment of the vast majority of the Philippine people, to conclude their editorial with a threat: "This is a man who must be stopped."

LPAC

LaRouche PAC demonstration targetting the New York Times.

Duterte Fires Back

Asked by the press about the *New York Times* editorial, President Duterte did not mince words: "Well, it's about time that their publication also must stop. New York Times—assholes, assholes. You cannot even criticize your own mistakes. Invading a country, making up excuses before the world that are not true, then you have the gall to say 'stop.' You better stop your publishing!"

Ernesto Abella, Duterte's presidential spokesperson, also denounced the *Times* editorial, calling it an appeal to the ICC "based on a complaint filed by a lawyer of a self-confessed assassin." The complaint is based on the testimony of a man who says he was part of a death squad in Davao, claiming that Duterte, who was mayor of Davao at the time, had ordered him and others to kill criminals. Abella noted: "The President was democratically elected to attack corruption and crime that have made so many Filipinos hostages to the criminals who had prospered through the rampant drug trade and other criminal activities that plagued our nation for decades."

On April 29, the highly respected Filipino journalist, Rigoberto Tiglao (a former cabinet minister, ambassador, and editor), posted an op-ed on the front page of the *Manila Times* titled: "Let Filipinos Condemn and Boycott the *New York Times*." Although he is addressing Filipinos around the world, he is well aware that there are nearly four million Filipinos in the United States, many in the New York area. Tiglao writes: "I'm sick and tired of the *New York Times* articles and editorials that are vicious hatchet jobs not just on President Duterte, but on the Philippines itself. *NYT* has portrayed our country as one where thousands of corpses of the innocent litter our streets, and that we Filipinos—and therefore even columnists like me—either just keep quiet in fear of Duterte, or that we are savages living in and embracing a failed state."

Tiglao identifies the methods of the West's color revolutions against leaders who refuse to follow colonial orders: "Have somebody file a case in an international body even if it is merely based on allegations by the opposition and hearsay, and then get U.S. media to sensationalize it. Here's some news for the Yellow Cult, whose rise to power in 1986 was to a great extent due to U.S. media: Those days are over."

The "Yellow Cult" refers to one of the first color revolutions, when Washington orchestrated a coup against the nationalist President Ferdinand Marcos under a yellow banner in 1986, which resulted in the dismantling of all of Marcos's industrial and economic development projects (including the completed nuclear plant in Bataan), leading to the economic and social collapse of the state, which still persists today.

Tiglao issues a challenge: "I dare the *NYT* to name a single political opponent of this regime and a single child killed by Duterte's alleged death squads." Tiglao also exposes the insane claim by the *Times* that, if the Philippine House of Representatives turns down an impeachment bill brought by the same lawyer who took him to the ICC, that would serve as proof that the country refuses to deal with the drug deaths, and therefore the ICC could claim jurisdiction. "What?" Tigloa writes. "If the Congress doesn't impeach Duterte, he is still guilty of mass murder anyway, so the ICC can intervene?" He notes that the plot to impeach (or assassinate) Duterte would put Vice President Leni Robredo, from the Yellow camp, in power.

Communications Secretary Martin Andanar reported that his office had sent letters to the *New York Times'* editors to debunk its editorials and articles. None has been published, Tiglao notes. "With these maliciously cruel and destructive [attacks] that the *NYT* has been unleashing against our country, we should all condemn this publication, and patriotic Filipino New Yorkers should boycott it. I urge my readers to do a patriotic act and write the *NYT* letters of complaints against their coverage and editorials. . . . Let's show these AHs [recall what Duterte called them] we're not pushovers, and we'll not allow biased reportage to slur our country."

CNN's coverage of Duterte is representative of the mainstream media's hysteria, in which the New York Times *is in the lead.*

Demonstrate Against the Times

On April 23, supporters of President Trump and representatives of the LaRouche movement held a demonstration in front of the *New York Times* building in Manhattan. As would be expected, the demonstration was not covered by the U.S. press, but the Russian news agency TASS covered it prominently under the title, "Demonstrators Demand *NYT* to Stop Lying About Russia and Syria."

TASS reported: "Participants of the action carried placards with slogans: 'The *New York Times* wants war with Russia, Americans want peace,' 'Do not let yourself be fooled again,' 'Read a new lie—it's the same as the old lie,' 'The *New York Times*—all the false news in print.' " It reported that LaRouche spokesman Dennis Speed told the demonstrators that before the Second World War, the *New York Times* published articles portraying Adolf Hitler in a positive light, and that it had played a central role in spreading the lie that Iraq had weapons of mass destruction, unleashing the criminal wars that have destroyed the Middle East.

TASS also quoted another LaRouche spokesman, Daniel Burke: "The whole world laughs at the *New York Times*. They have become miserly servants of those who seek war and chaos."

Trump Calls Duterte

President Trump called President Duterte on April 30, praised him for his battle against drugs, and invited him to the White House on a date yet to be determined. The *New York Times*, of course, went ballistic: "Mr. Trump's affinity for Mr. Duterte, and other strongmen as well, is firmly established. Both presidents are populist insurgent leaders with a penchant for making inflammatory statements. Both ran for office calling for a wholesale crackdown on Islamist militancy and the drug trade." Imagine that: Trump and Duterte want to stop terrorism and drugs!

The *Times* drags out John Sifton, a spokesman for Human Rights Watch, the institution funded by British agent George Soros, the leading promoter of legalizing drugs throughout the world. Soros, together with former president Obama, is also the primary driver of the ongoing color revolution against Trump himself. The *Times* quotes Sifton: "By essentially endorsing Duterte's murderous war on drugs, Trump is now morally complicit in future killings. Although the traits of his personality likely make it impossible, Trump should be ashamed of himself."

The *Times* also lies wildly that President Trump is trying to mend the alliance with the Philippines as a bulwark against China's expansionism in the South China Sea. This is particularly laughable, since Trump has repeatedly stressed that he has the greatest admiration for Xi Jinping.

The LaRouche movement heartily welcomes President Duterte, his government officials and diplomats, and all the Philippine people to join in the next demonstration by the LaRouche movement at the office of the *New York Slimes*, which will be announced soon. Write to me to get the date and time, at: mobeir@aol.com

Greater Financial Collapse Looms in 2017; Glass-Steagall Must Be Restored To Stop It

by Paul Gallagher

April 29—Ten years ago the cover feature of this magazine's March 23, 2007 issue was titled, "How U.S. Mortgage Crisis Can Trigger Global Crash." Analyzing the exposure of the post-Glass-Steagall megabanks of the United States and Europe, to the securities and derivatives related to the then-$11 trillion mortgage bubble, *EIR* warned of the blowout which would accelerate over the following 18 months, leading to full-blown global bank panic in September 2008. We emphasized that Lyndon LaRouche was the only economist who had foreseen this.

In meetings with elected officials over the weeks following the publication of that article, leading Members of Congress and others rejected *EIR*'s warning as impossible. A decade earlier, the Glass-Steagall Act had been eliminated after it had preserved banking system stability against panics and crashes for 60 years. In early 2007, the idea that this was bringing on a general financial crash within less than 10 years, was dismissed out of hand.

EIR Editor-in-Chief Lyndon LaRouche's July 2007 proposal to stop the coming crash with emergency legislation, combining Glass-Steagall bank reorganization with a national moratorium on foreclosures, was kept out of Congress by Wall Street, despite broad constituency support.

The blood and tears are still running from the economic collapse, the mass unemployment, and the impoverishment of Americans which that 2008 crash brought on. Again the choice was posed in 2009-2010: Restore Glass-Steagall to prevent this from happening again, or accept Obama's Wall Street-approved substitute, the Dodd-Frank Act. Again, the wrong choice was made.

Now *EIR* is warning that another, worse collapse is looming, this time from the Wall Street megabanks' exposure to an even larger bubble in speculative corporate debt which is showing alarming patterns of defaults.

The Signs of Crisis

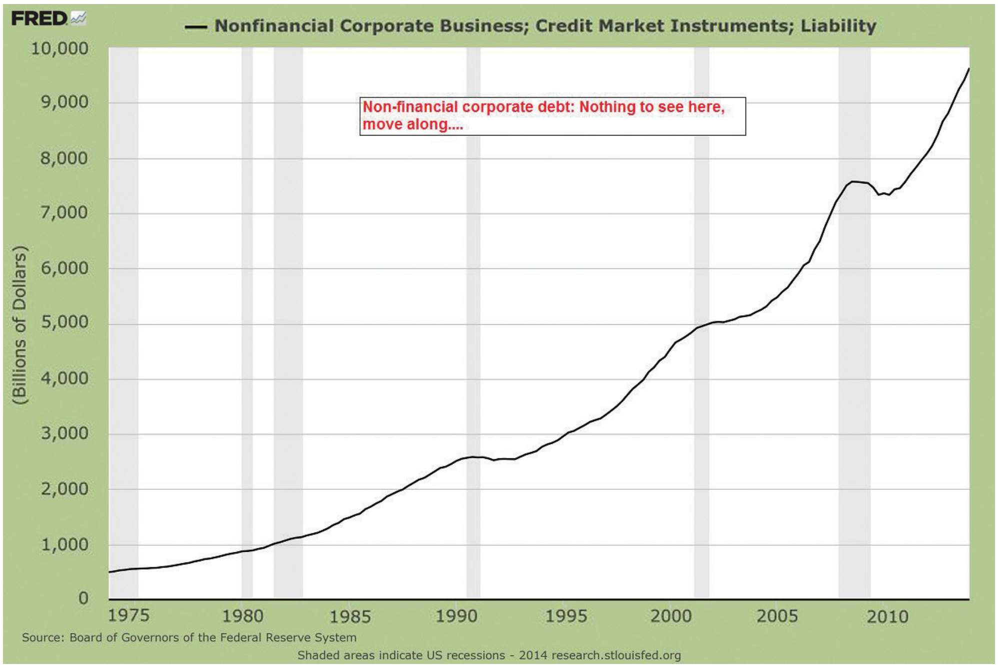
• The debt of U.S. non-financial corporations has reached over $13.5 trillion—$11 trillion owed to banks

wikipedia

It is up to the U.S. Congress to restore the Glass-Steagall Act. Here, the U.S. Capitol, home of Congress.

FIGURE 1

Nonfinancial Corporate Debt



and the remainder to "shadow banks" such as money market mutual funds, pension funds, and similar funds. That debt has grown from $8 trillion in 2008—by 75% in eight years. **Figure 1** shows the extraordinary rate at which the banks' portion—only—of that debt bubble grew, both leading into the 2008 crash and after it, up through mid-2015. Feeding this explosion of corporate debt was the vast money-printing of the central banks of the United States, UK, Japan, and the Eurozone: their $15 trillion in lending facilities to big banks, with effective zero interest rates, is now in the tenth consecutive year for these central banks.

• That debt growth has levelled off in 2017. Growth in total U.S.-based banks' credit has suddenly dropped from 4.5% to 2% annually; commercial and industrial lending growth stopped entirely six months ago and it is now falling. Bloomberg reported April 26: "Total loans at the 15 largest U.S. regional banks declined by about $10 billion to $1.73 trillion in the first quarter, compared with the previous three-month period, the first such drop in five years, according to data compiled by Bloomberg. . . . A slump in commercial and industrial lending sapped growth." One example from *American Banker* April 25, involving Fifth Third Bank, a large Cincinnati-based regional, was reported as follows: "The withdrawal from auto lending was said to be a conscious choice to reduce lower-return auto originations to improve returns on shareholders equity, while the decline in C&I [commercial and industrial—ed.] lending was described as a deliberate exit."

• In the years since 2013, some 80% or more of this borrowing has been used by larger corporations for "financial engineering"; that is, buying their own stock to drive it up, or buying other companies' stock in mergers and acquisitions which have the same effect. Some $500 billion *each year* has gone into driving up stock market indices, while betting on them. But total non-financial corporations' profits have not increased since 2011; and in the three years since 2013, they have fallen.

• Thus, debt leverage has jumped up. Morgan Stanley bank itself published a detailed research note on April 20 which reported that the ratio of non-financial corporate debt to cash-from-operations is at an all-time-high of 3.2:1 (2.7:1 is the highest it has ever been before, the bank reported). Companies have low and falling "interest coverage," or ability to even pay interest from earnings—coverage levels like those in the 2001 recession and the 2008 crash (**Figure 2**. With debt flying up relative to operating cash, and profits declining, companies can keep servicing debt by borrowing more. But the banks' decision to put the brakes on new credit, means they are aware the bubble has rolled over its top and is headed for big trouble.

• The IMF 2017 "Global Financial Stability Report" finds that in the United States, the debt service to income ratio of non-financial corporations has risen quickly from 37% in 2014, to 41% in 2016. Those corporations have $7 trillion more debt than at the 2008 crash, but $3 trillion *less* equity invested in them.

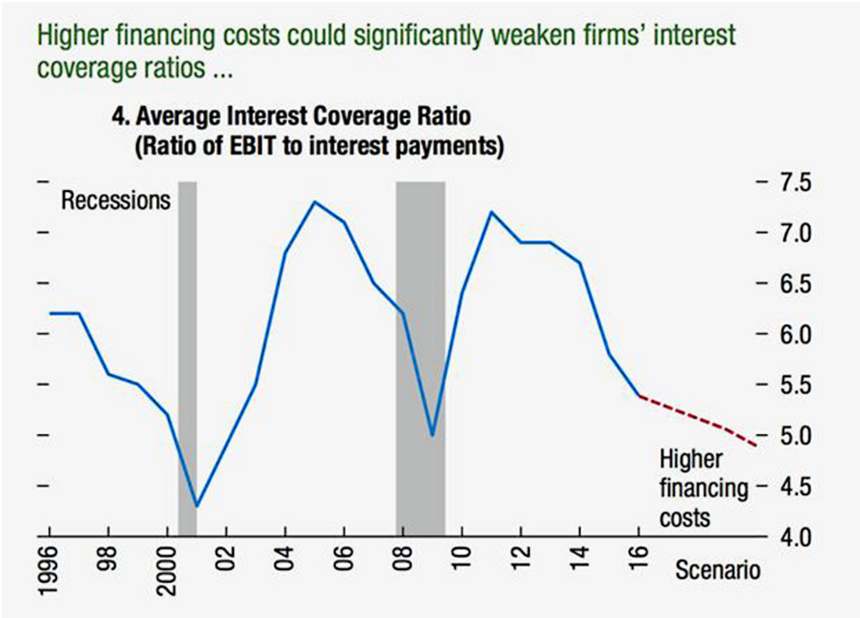
Wave of Defaults Begins

Now increased corporate default rates have appeared like the dark clouds Shelley called "the locks of the approaching storm." A telltale came last week from the top, Goldman Sachs.

Goldman makes corporate and "industrial" loans from its Salt Lake City division. The *Salt Lake Tribune* reported April 24:

> Goldman Sachs's fixed-income revenue was so unexpectedly weak in the first quarter that last week's earnings report left the stock tumbling and Wall Street buzzing over what happened. Traders got burned by a constellation of souring debts. . . . The bank incurred tens of millions of dollars in losses on companies including Peabody Energy and Energy Future Holdings Corp. Borrowings from retailers including Rue 21 Inc., Gymboree and Claire's Stores also soured, the people said.

FIGURE 2



The default rate for all non-financial corporations has jumped from 3.0% at the start of 2016 to 5.0% at its end. It is continuing to rise, and S&P Global Fixed Income Research warns it will be at 5.6% in June. It estimates that 99 U.S. companies will default in the June 2016-June 2017 period, compared to 79 in the preceding year, and the liabilities involved will be 85% higher.

The *Wall Street Journal* reports that 10 retailers with more than $50 million in liabilities filed for bankruptcy in the first quarter of 2017, whereas there were nine such in all of 2016. Some 8,650 retail stores will close in 2017, estimates Credit Suisse research, three times the 2,700 which closed in 2016, and higher than the previous 2008 peak in retail busts.

The default rate for "high-yield" (i.e., subprime) corporate debt had more than doubled in a year to 6% at the end of 2016. (**Figure 3**). And the corporate "subprime" debt bubble—junk bonds and leveraged loans—exceeds $2 trillion.

The IMF, in the "Global Financial Stability Report, 2017" cited above, made the shocking estimate that if U.S. interest rates climb sharply again—as they did in November through January—20% of *all* U.S. corporations could default. That is higher than the highest mortgage default rate ever reached in the crash ten years ago, even for subprime mortgages, which did not exceed $1.5 trillion in debt.

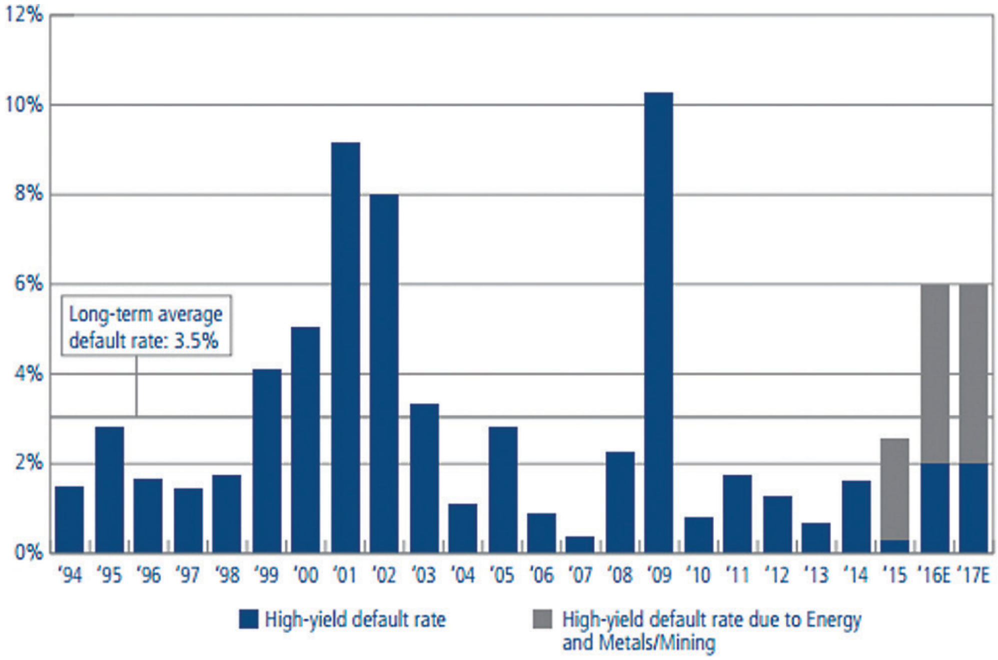
A new report on corporate debt defaults by Standard & Poor's (covering only companies with credit ratings) finds:

"Despite oil prices rising for most of the year, the energy and natural resources sector had increased default activity over an already elevated 2015, and the sector accounted for over 50% of all defaults in 2016. This helped push the corporate default count up to 162." This is double the average annual number since the crash. "These 162 defaulted issuers accounted for $239.8 billion in debt, which is more than double the $110.3 billion total for 2015."

That 2015 rate was already equal to that of 2007; 2016's rate was the highest since the collapse of 2009. S&P's report is global; but 68% of all the debt originated in, or is held by. U.S.-based financial institutions.

Defaults have gone still higher in credit card and

FIGURE 3
Corporate Debt Default Rate



auto loan debt, and are above 25% in student loan debt; but none of these bubbles is near the size of the deteriorating corporate debt bubble.

No Growth Increases the Danger

The gigantic bubble of corporate debt used for own-stock-buying, mergers and acquisitions, financial engineering, and general Wall Street-pumping, is made more unpayable, and more dangerous, by the continuing lack of economic growth, productivity growth, or growth in business capital investment. The miserable 0.7% rate of GDP growth in 2017's first quarter was a sign of the hole the underlying economy is sliding into, unless entirely different policies are adopted immediately.

The practices major banks engaged in 10-11 years ago—to "dump" their exposure to toxic mortgage derivatives debt onto other funds and individual savers around the world before it became worthless—were fully exposed in 2011 hearings of then-Sen. Carl Levin's Senate Permanent Investigations Subcommittee. They were dramatically revealed in the book and movie, *The Big Short*. Those practices were not enough to save the big banks from their own losses, and those were bailed out with tens of trillions in taxpayer loans, investments, and guarantees.

Now the same banks, 30-40% larger from absorbing 2,000 small banks which disappeared, are doing the same thing with their corporate debt and related categories like subprime auto loans: turning off the credit spigot, packaging the loans into securities, and then dumping them along with derivatives—JPMorgan and Wells Fargo are even lending to money managers so as to sell them more of the trash.

To stop those banks' increasing practices, at this moment, of repackaging and transferring the risk from this huge mass of endangered debt and derivatives to their own depositors and to taxpayers, Glass-Steagall *must* be restored now before the mass of increasingly unpayable debt collapses.

This critical situation underlies the sudden appearance of high-profile attacks on Glass-Steagall in leading media of New York, London, and Washington, D.C. Glass-Steagall is the wolfsbane of Wall Street and the City, and they fight it even more aggressively as a crisis rises around them. *All* of the attacks date from the April 5 introduction of the Senate 21st Century Glass-Steagall Act, and the reporting that its sponsors (now six) had received some form of encouragement from President Trump's head of the National Economic Council, Gary Cohn.

The attacks on Glass-Steagall, in number, volume, and tone have become indicative that the City of London and Wall Street, knowing the signs of an approaching financial crisis, are very nervous about Glass-Steagall's prospects and are commissioning well-fed "scholars" and "fellows" to try to debunk it. American elected officials, dangerously, are not aware of those signs or have dismissed them.

IN MEMORIAM

Grace Henderson McMullen Littlejohn

by Diane Sare

May 2—On April 4, 2017, I happened to be in Washington, D.C. and fortunately decided to drop in on an old friend. Although she appeared much more frail than when I had last visited 2 years ago, Grace Littlejohn was up on her feet, asking me "What kind of mess are y'all in now?"

She pointedly asked me, "Do you remember that book LaRouche put out on the Conspiracy to Destroy our Schools?" "Yes," I replied, "You mean *The Libertarian Conspiracy to Destroy America's Schools*." She nodded and went to a chair and pulled up the report, which was clearly well read and studied. At the ripe old age of 99, she was still completely preoccupied with the question of the education of America's children.

Grace Henderson McMullen Littlejohn

Also, at the age of 99, she had re-written her 1955 Master's Thesis and had it published by Crystal Stairs, Inc. in Palm Beach, Florida. It was called, *History of the College Library, Livingston College, First Library 1888-1954*. She proudly gave me a copy, and pointed to the page about herself which was a chronology of her collaboration with one of America's greatest thinkers, Lyndon LaRouche.

What Grace represented is a commitment to the future, typified by a number of remarkable individuals of her generation, including mathematician Katherine Johnson (now famous because of the film *Hidden Figures*), the assassinated President John F Kennedy (b. 1917), and Lyndon LaRouche (b. 1922), among others. Grace graduated from Livingston College in 1938 with BS degrees in both mathematics and natural science. After earning her Masters in Library Science in 1955, she moved to Washington, D.C., where she taught mathematics in a few different middle schools, and then moved on to become the head librarian at the prestigious Paul Laurence Dunbar High School.

One of Frederick Douglass's grandsons, Haley George Douglass, had taught math and science at Dunbar High School until just 8 years before Grace Littlejohn became its librarian. He was a graduate of Exeter Academy and Harvard University. His half brother had been the famous violinist Joseph Douglass, the first African-American musician to ever be recorded by the Victor Talking Machines Company. Grace often lamented that the desegregation of Washington, D.C.'s all-Black schools had been used to devastate the formerly very high standard that they had kept—Dunbar the highest of all.

After retiring from teaching, Grace got involved in politics, in the Democratic Party and in the neighborhood, where she became an elected representative of the "Advisory Neighborhood Commission." It was in this capacity that she received a phone call from long-time LaRouche associate Dr. Ernest Schapiro, who was coordinating distribution of the just released *Ugly Truth About the ADL*" (She used to love calling it "the truth about the ugly ADL.") While she doesn't mention the book by name, she wrote the following in her paper:

> *From History of the College Library—Livingstone College,* p. 77:
>
> "Mrs. (McMullen) Littlejohn, a successful educator, is proud to say that she sponsored the first official student voter registration and education campaign which served as a major impetus for the election of a student representative to the D.C. School Board. She became very concerned that after 35 years of positive relationships with students, it became very, very hard to motivate them. She realized then that not the school personnel, nor the parents, nor the strong community organizations are totally to blame. Mrs. Littlejohn believes that outside evil forces are causing the collapse of our educational system, our community and our homes, thus damaging our children's rightful inheritance to a good education. This belief motivated Mrs. Littlejohn to continue fighting for social justice and civil rights through her participation with the Schiller Institute. In 1994, Mrs. Littlejohn became a candidate for the Board of Education in Ward 4 on the Lyndon LaRouche ticket. The question was asked, 'Why Lyndon LaRouche?' The answer, 'I have read literature published by associates of LaRouche, I have spoken with Mr. LaRouche. I asked him, What can you do for our children, especially our minority children who are being destroyed? He responded that he would do what he could. He is among the few who have openly said to me that the deep-rooted problems in the Afro-American and minority communities can be traced to the funneling of drugs into these communities.' "

EIRNS/Stuart Lewis
Grace Littlejohn on Oct. 15, 1996, at the Washington, D.C. Federal Courthouse, after she joined the LaRouche lawsuit against Democratic National Committee Chairman Donald Fowler.

She then goes on to describe joining the lawsuit filed by LaRouche and several of his voters in 1996, when the Democratic Party refused to allow delegates to be assigned to Mr. LaRouche at the national convention, even though LaRouche had garnered the requisite 15% or more of the vote in certain Congressional Districts in the Democratic Presidential Primary Election. Grace writes:

> Mrs. Littlejohn's civil rights were violated by the National Democratic Party—a party that Mrs. Littlejohn had been a member of for over 52 years—and by the D.C. State Democratic party.

All those who spoke about Grace Littlejohn at her funeral spoke of her "sassy, but graceful" defiance of popular opinion. Several laughingly told how she would ask their views on various matters and possible courses of action, but then would, "go on and do exactly what she intended to do, as if you'd never said anything." Her life and story are a vivid reminder of a true American Spirit which can be reignited today by LaRouche's leadership. She would appreciate that commitment—to be what she called "servant leaders" for mankind.

II. A Community of Common Destiny

SCHILLER INSTITUTE CONFERENCE

The Belt And Road Initiative, The World Land-Bridge, and Corresponding Ideas in Western and Chinese Culture

Panel II

The Physical Economy of the Future

The Panel II presentations, in the afternoon of April 13, focussed on the development aspects of the Belt and Road Initiative. The presentations by Jason Ross, Benjamin Deniston, and Dr. Hal B.H. Cooper, Jr. provided an overarching scientific perspective regarding the "incommensurables" that must be measured and built upon, in realizing the new New Silk Road and World Land-Bridge economic platform. The singular role of nuclear energy development, including fusion power, was underscored, along with mankind's extraterrestial imperative to explore and colonize the solar system.

They were followed by four speakers on China's infrastructure accomplishments at home and abroad (see page 23, this issue).

Panel II as a whole carried forward and applied the overall dynamic of the Panel I focus on the conceptual level (see *EIR* of April 21), and addressed the following subjects:

• A discussion of Lyndon LaRouche's economic concepts as applied to infrastructure as a platform,

• The programs for integrating the Americas into the Belt and Road Initiative,

• The stunning success China has had in becoming the world's leader in high-speed rail,

• The potential for southern Asian integration with reference to the example of Bangladesh, the most densely populated nation on the globe,

• The energy requirements for full development,

• The long-term maintenance and physical sustainability needs for a project of such immense scale and duration, and

• The need for an outlook toward space infrastructure as a driver for mankind as a whole.

A half-hour summary video of the conference can be found at: https://www.youtube.com/watch?v=_kyHgbB8H1Y

EIR's YouTube channel is here: https://www.youtube.com/channel/UCQJe_Wd7vFqKJXfJWov9xmg

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EIRNS/Jason Ross

Conference participants in discussion between sessions.

The Value of Infrastructure

by Jason Ross

Dennis Speed: I want to welcome you on behalf of the Schiller Institute to Panel II of our conference—"U.S.-China Cooperation on the Belt and Road Initiative, and the Corresponding Ideas in Chinese and Western Philosophy." The first speaker for this afternoon's panel is Jason Ross, editor-in-chief of *21st Century Science and Technology* and co-author of "The New Silk Road Becomes the World Land-Bridge."

Jason Ross

Jason Ross: It's very good to be here; I'm glad to see so many people in the audience. I think that we've heard really tremendous presentations this morning on what the Belt and Road Initiative can mean for the world, what the World Land-Bridge can mean as a new standard of relations among nations and as a new basis for economics. I think one of the things we heard was that geopolitics is being replaced by the Belt and Road Initiative—a new way of relating among nations. Geopolitics—the British Empire—this explains why, for example, the United States did not join the Asian Infrastructure Investment Bank. It does not explain, by itself, why the United States let its infrastructure completely decay. So for that, I want to take a look at what new thoughts about economics are required by the Belt and Road Initiative.

If we look overall at the value of infrastructure—that's what I want to focus on today, because there are aspects of infrastructure that make it different from anything else in the economy. Wrong economic thinking about it prevents financing and prevents it from being built, and holds us back from reaping all of the benefits that we could from investments in these sorts of projects. If we look at the human species as a whole, what characterizes us is that over historical time, we have become a new species—repeatedly. If we were looked at from the standpoint of biology, you would say that the human species has been supplanted and transformed into a new species, a new genus, a new family, many times in our history. We've seen this in the changing relationship that we have to our environment. We've seen it in the changing number of people that can exist on the planet.

This [**Fig. 1**] is a chart of human population over the past 10,000 years. No animal species willfully changes the number of its species that can live on the planet; we do that. How do we do that? We do that in what makes us human, which if we look back to the Greek creation story of the human species, to the story of Prometheus, we're told a tale of how the human species was created. This tale asserts that before Prometheus, we had bodies that were human, but we didn't have minds; we didn't use fire. Prometheus, in giving fire to mankind, and number, and poetry, and astronomy, and the calendar, and all of the arts, and metallurgy, and

FIGURE 1

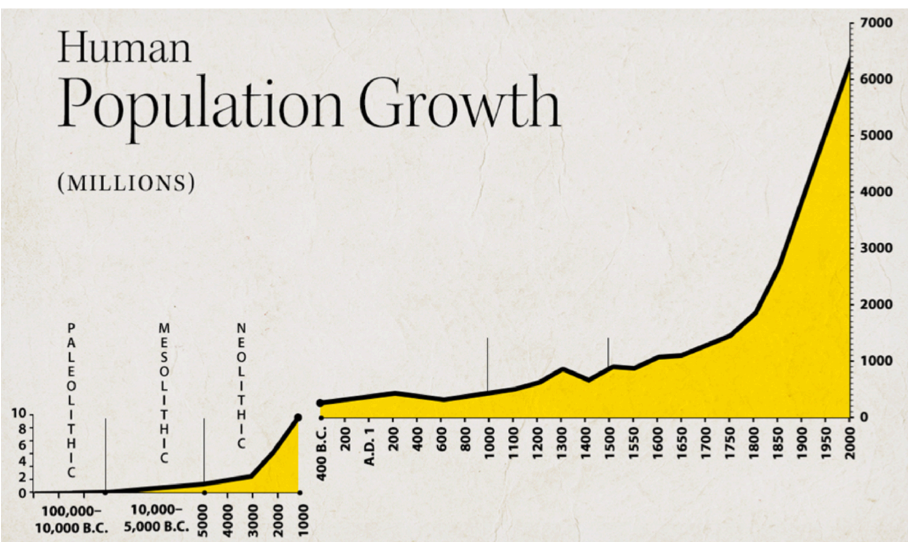
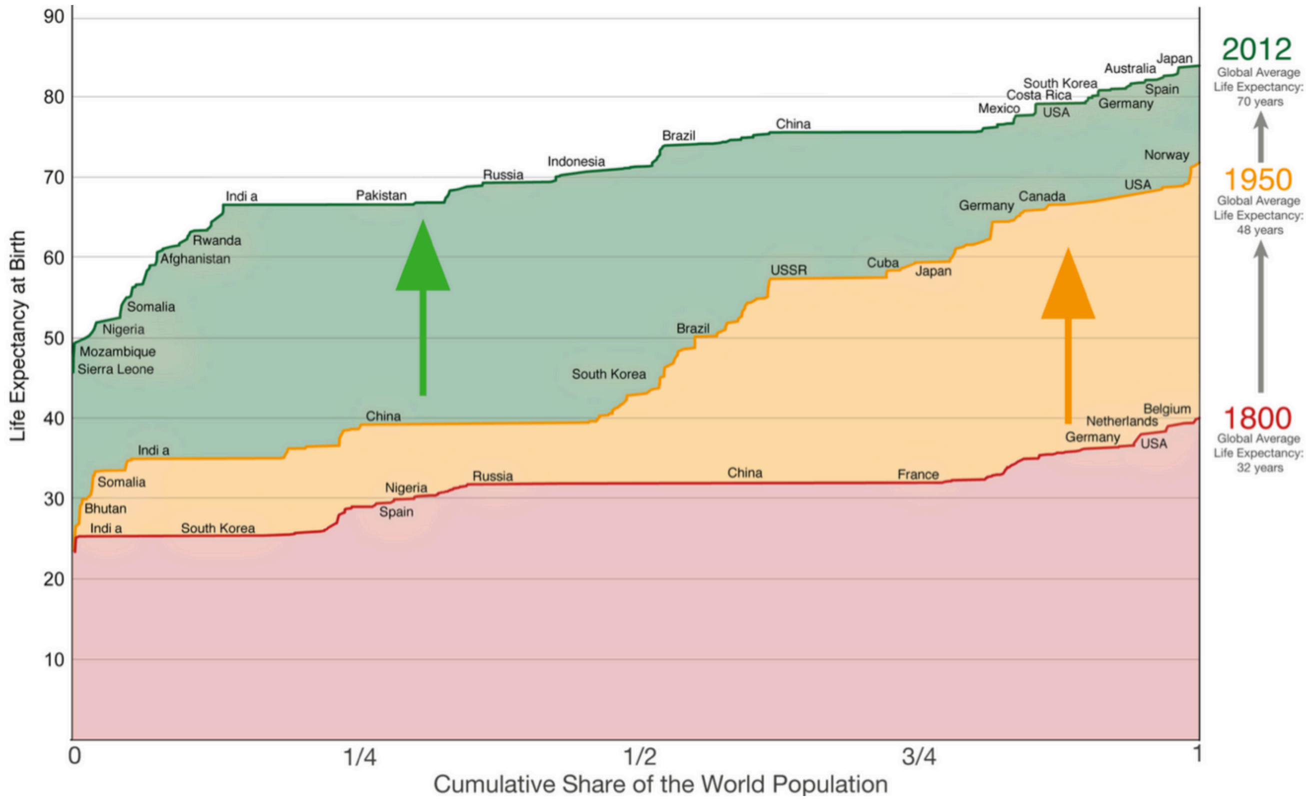


FIGURE 2
Life Expectancy



medicine, and sailing ships, and the use of animals—by giving knowledge to mankind, we became a new species on this planet. That's the basis of our transformation in our living standards. Here [**Fig. 2**] you see a chart of life expectancies over time. The red line is life expectancy for different nations in 1800; where you can see that even the nation with the highest life expectancy, Belgium, their life expectancy was only 40 years in 1800. Think what the average age of a person in a society like that would be. How advanced could such a society become, if this is the maximum age people are reaching? You see a tremendous increase. You see what had been reached by 1950, and now today—2012 and beyond—every nation in the world has a life expectancy that's greater than that of Belgium, which had the highest 200 years ago. That's something to be very happy about and proud of, and reflects something that's absolutely different about our species from any other sort of life.

What is 'Infrastructure?'

So, what is infrastructure? Think about the word "environment" for a moment. We use it in many contexts. Sometimes we mean specifically things like the air and the water around us; sometimes it has a more general meaning, like the ambience. What's the environment in a social situation? What's the environment like in a restaurant, for example? But our environment—the world around us—is increasingly one that we create. The resources that we use—unlike animals—are not ones that we find around us. An animal looks for plants to eat; a plant hopes some sunshine will land on it. These are just things that are around it; it doesn't create them, it uses them. For us, this synthetic environment that we create for ourselves, is our infrastructure. By mediating our discoveries that we have made, the science that we know, the technology that we're capable of—by implementing them as a platform of infrastructure, we set ourselves up for a certain level of civilization, of economic potential.

Very quickly, I'm going to run through three ways that this happens [**Fig. 3**]: in power, in materials, and in space and time. If we look at a chart of power use [**Fig. 4**] in the United States per capita over the history of our nation, we see both that power use overall has increased per person, and that the source of that power has changed from wood, to coal, then increasingly to oil, and natural gas. Fission never really made it off the ground. So, we have produced more power and of a dif-

FIGURE 3

FIGURE 4

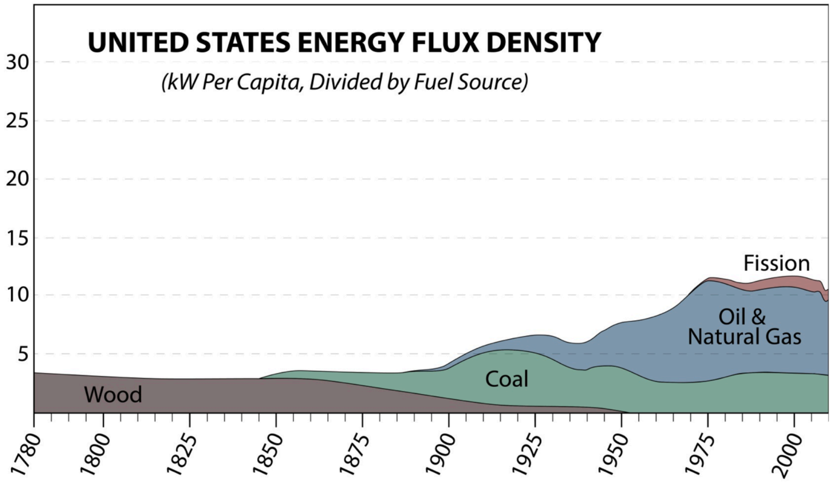


FIGURE 5

Electricity Consumption vs. GDP, per capita

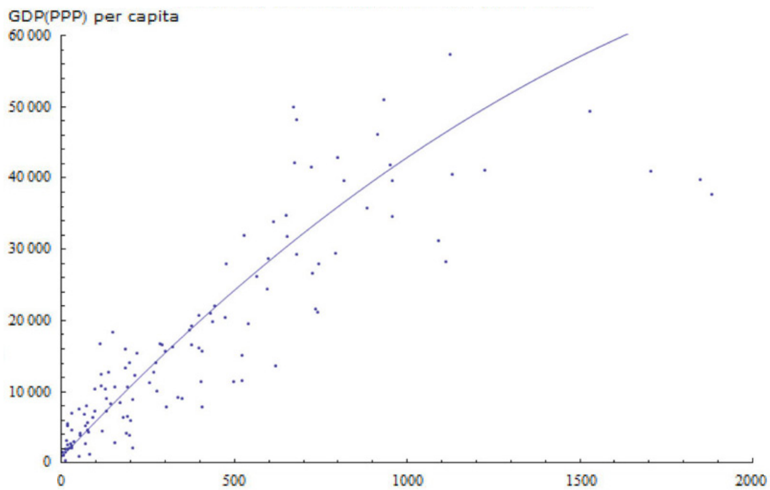


FIGURE 6

World Lighted at Night

ferent kind. We can do something with oil that we can't do with wood. You are never going to build a car that operates on wood chips—impossible. You can have a car that operates on oil. You're not going to have an airplane where someone is shovelling charcoal into a burner on it—never will happen; it's something we can do with oil. Then think about what we can do with electricity—more on that in a moment.

Take a look at this chart [**Fig. 5**]. On the x axis, we have electricity used per capita—this is for all nations in the world; compared to per capita GDP. You can't have a high standard of living, even as measured in GDP—which is imperfect—without electricity. Energy or power is required for a high standard of living. What sources will be able to provide five times the world's current power use? For the world as a whole, per capita, to use as much energy as a person in the United States per capita, we need five times as much energy. What will provide five times the current total energy on the planet? What power source is capable of doing that? Here [**Fig. 6**] you can see the uneven development currently, as exhibited in this very clear marker of power—light at night.

One other thing on that: In terms of the way we use power—take for example uranium. Now uranium used in a nuclear power plant has a tremendous amount of power in a very tiny amount of fuel. Uranium could be burned; you could burn uranium if you wanted to. So, you could take uranium and put it in a coal power plant; you could throw it in

FIGURE 7
World Production of Rare Earths (tons)

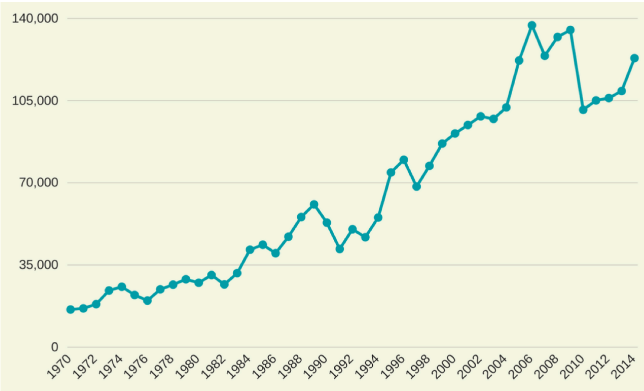
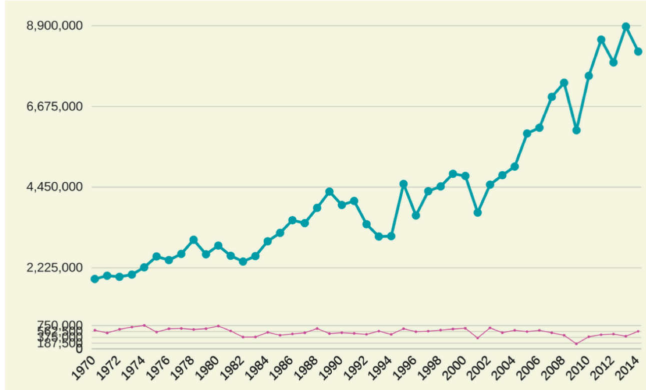


FIGURE 8
World Production of Chromium (tons)



and burn the uranium; boil water, create steam and run a turbine. Does anybody have any idea how much less power you get from uranium if you treat it as a chemical, compared to a nuclear fuel? About 100,000 times is the difference. There's a limit for all chemical fuels. The power in the electric bonds that combine the atoms in a molecule, the power that's just potential in that kind of physical relationship is less than that in the nucleus by a factor of 100,000. Tremendous difference.

Think about the materials that we use. The materials that we use on a regular basis have changed throughout human civilization as well. Things that we take for granted or use on a daily basis—like aluminum—are possible only in an economy that has electricity. Without electricity, aluminum is very hard to produce; and bauxite is really not a resource, it's not commercially viable to produce aluminum from it without electricity. The plastics that we use—this is the other big use of oil. Besides airplanes, which I can't imagine running on a battery, the other necessary use of petroleum is plastics. But if you look at our relationship to material after material, to steel, to iron, to our production of nitrogen. . . . Artificial nitrogen fertilizer, is a technology which by itself has increased the potential population of the planet by 25%-30%. Our environment is one that we create; and the resources that are around us are ones that we create. We create a resource. Discovering how to turn a rock into a metal; we have just now created a resource where one did not exist before.

The Man-Created Environment

If you look at the change in how these are used—the amount of steel that we use, the amount of coal that we use; the production of rare earth elements. People say that the use of resources like oil has fueled much of the

FIGURE 9
World Production of Fixed Nitrogen (tons)

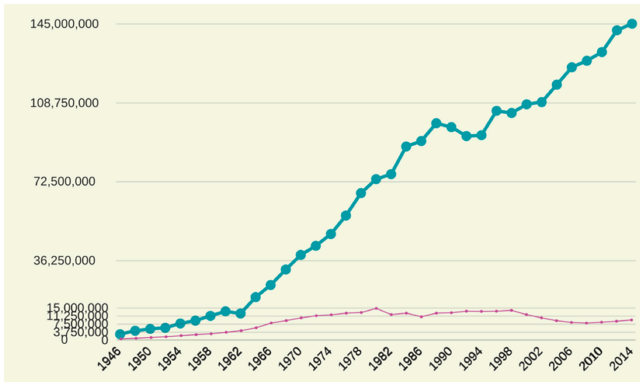
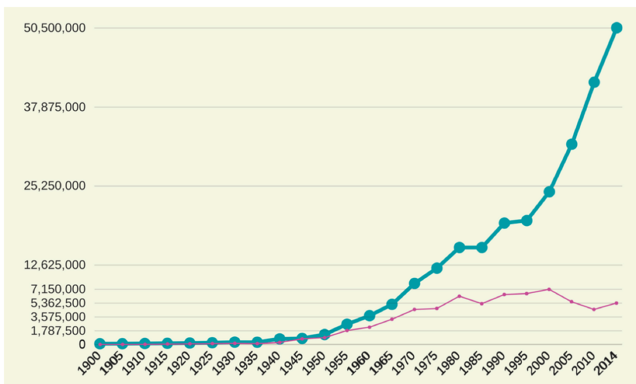
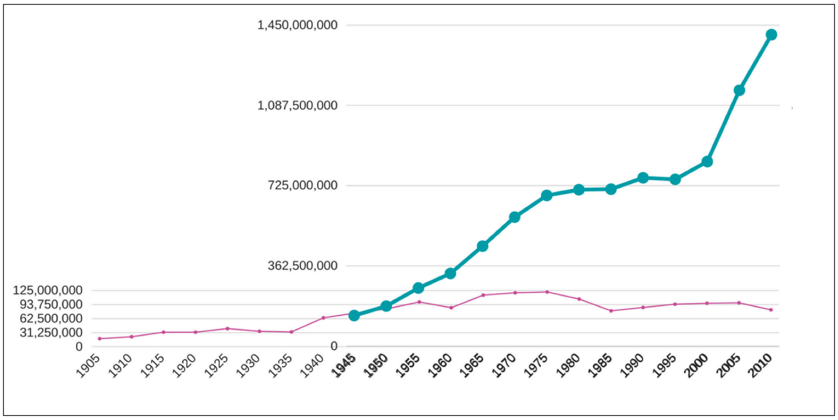


FIGURE 10
World Production of Aluminum (tons)



conflict in the world, because of people trying to control the use of this precious resource. But what about rare earths? [**Fig. 7**] These weren't even considered a resource 50 years ago; now they're a very major one. We made it so. Similarly chromium, nitrogen, aluminum, and steel [**Figs. 8, 9, 10**].

FIGURE 10
World Production of Steel (tons)



We also transform our physical environment in the sense of the space that's available to us economically [**Fig. 11**]. Look at the distance that you could travel from New York over a certain period of time in 1800, where this line represents the limit of two weeks' travelling from New York. By 1830, this is the line of the extent of two weeks' travel from New York. It wasn't because faster cars were produced; it's because we transformed and created a synthetic environment for ourselves. We built canals; we built roads. We *transformed* our environment. By 1857 [**Fig. 12**], two weeks gets you all the way out here; we have rail lines by this time, in the eastern part of the United States. And by 1930 [**Fig. 13**], you could reach anywhere in the country in less than half a week.

So, if we try to understand as economists, the value of this type of infrastructure, we really miss the point if we only look at a business-by-business standpoint and try to estimate how much a certain business will benefit from reduced freight costs, or reduced shipping times. What we have to take into account is that an entirely new type of economic production is now possible. Now you can produce intermediate goods and ship them elsewhere. That kind of connectivity in industry is possible. It gives us the ability to move resources around, and to site production in different locations. You've transformed how useful land is, in all the areas along which this development corridor extends. So, those are three ways that we've transformed and created an environment which we can call infrastructure.

For the future [**Fig. 14**], I think the three big things are: 1) The development of fusion power, which will transform our relationship to nature in a way that's like the development of the steam engine, in terms of how huge the difference will be. Then we will be able to produce great quantities of power. And this gets to the

FIGURE 11

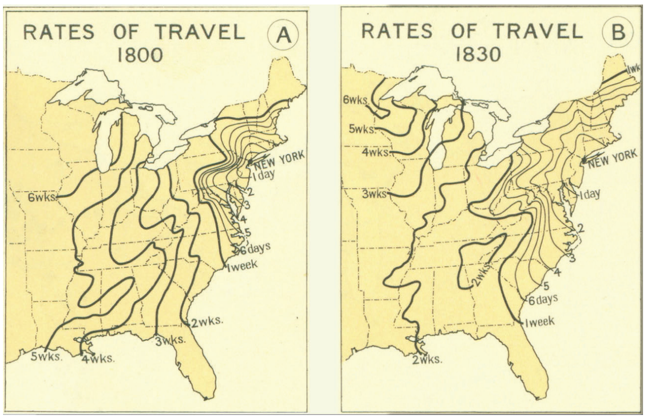


FIGURE 12

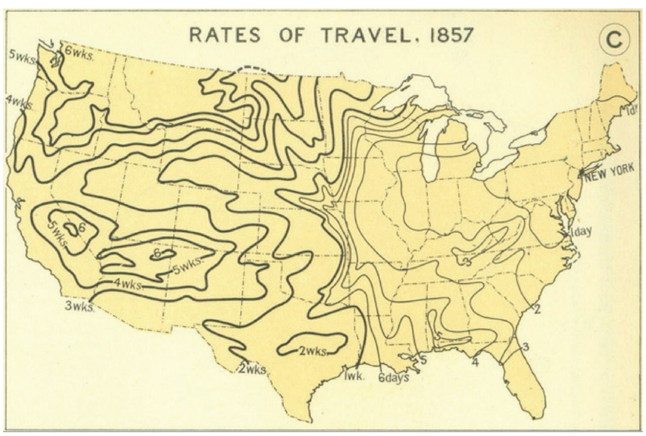


FIGURE 13

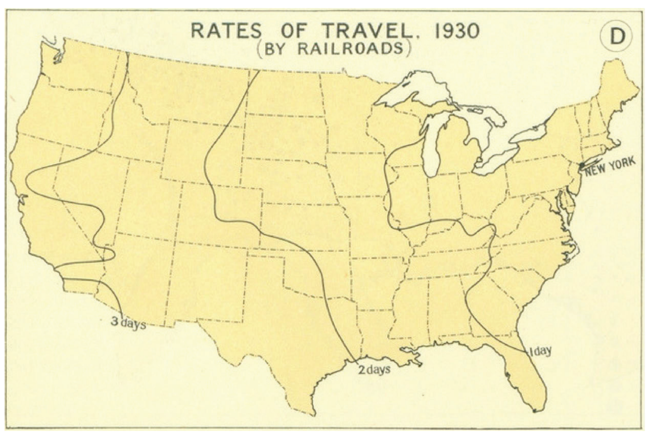


FIGURE 14

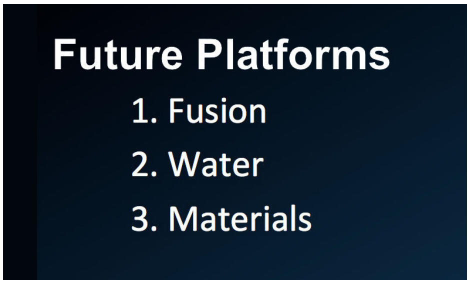
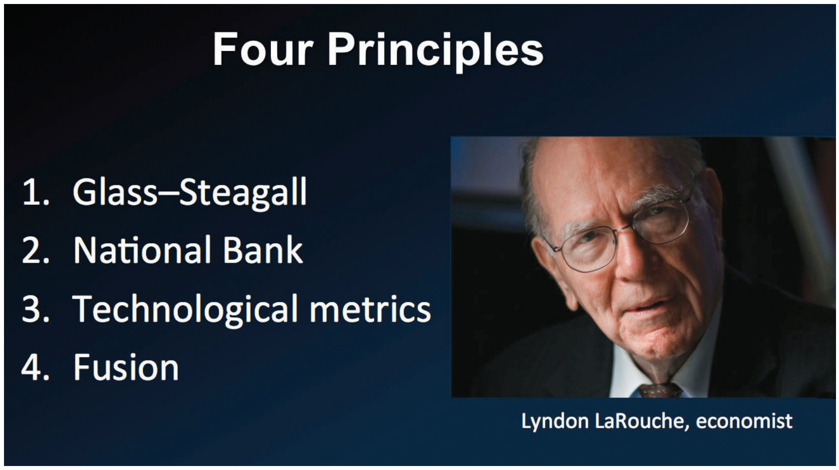


FIGURE 15



second point—we could desalinate ocean water, to have a better control over our water systems on the planet, and totally transform our relationship to materials. With fusion, we would no longer need coal to produce metals, as we do today, since we are forced to use chemical processes.

I'd like to now discuss three problems that economists have in understanding the value of infrastructure, and then lay out four techniques for successful economic policy. The first problem with the value of infrastructure and science, is that the payback is not commensurable with the expense. To a monetarist—the way that economics is generally taught now—if you spend money and you make money, the return is some percentage of the cost. If you gamble on e-trade and you make money, you spent money and you made money. It's like playing poker or anything else.

That's not the case when you're investing in a new platform of infrastructure. If you build out electricity lines across a nation, and now all of the economy can benefit from the use of electrical production—the payback is not a multiple of the cost. You have an incommensurable economy as a whole. How do you measure the value of that? Not purely in dollars, that approach misses it. How about in potential lifespan? How about in potential population? Much better measures.

The second problem is that the value of an infrastructure platform or a scientific discovery cannot be localized, or expressed as the sum of localized bits of value added. That transcontinental railroad system as a whole had a value that can't be localized. The discovery of a scientific principle—Lise Meitner's hypothesis that uranium was not decaying, but was actually fissioning, or breaking up into large pieces. That idea of hers—which was right—is the basis of fission power. That one idea transforms the entire human species instantly. As a whole, we are a different species based on an idea created by one person—not localizable, right?

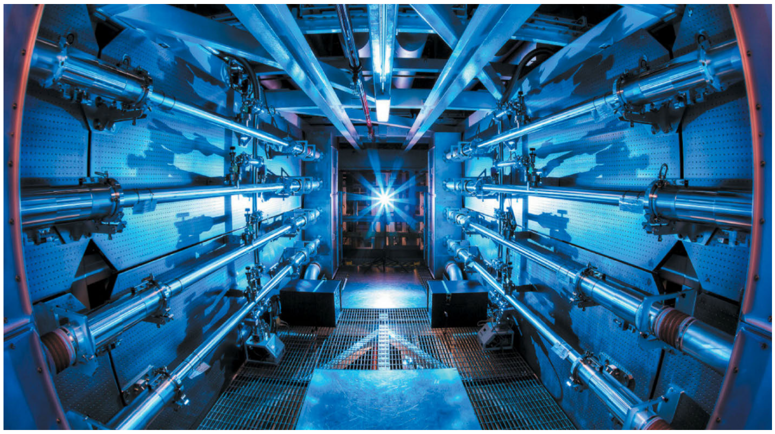
Limitations on Private Financing

The third problem with infrastructure when economists try to account for it, is that the return is indirect. If you build a dam and prevent flooding, you don't make money directly from having done that, but clearly, it has a value. Something that Rafael Correa pointed out in Ecuador recently, with the massive flooding that had caused a great deal of devastation in Peru and Colombia—but Ecuador got by reasonably well, because they had invested in water-management infrastructure.

Correa said, "Bankers make the mistake of looking for a return. That's fine sometimes for a private venture, but it's not right for the state as a whole." So if you think about things like public roadways, local roadways—these are things that don't create a direct return in the way that building an airport terminal would. While a public-private partnership might indeed invest the money in partially rebuilding La Guardia airport, you're not going to get a PPP to take on a huge project like building up a transportation network to the Bering Strait. The return is too long-term and indirect. Therefore, it's a problem to think that you have to be able to attract private finance. We need mechanisms that are appropriate for the nation, and those mechanisms are different than what a private enterprise would do.

So, let's take a look at these four mechanisms, these four principles [**Fig. 15**] in order to make all this a reality. Lyndon LaRouche, the economist, put forward four principles to make a recovery possible. The first one is Glass-Steagall. Many economists think that the way you create demand or growth in an economy if it's sluggish, is that you lower interest rates and just make more money available. Trillions of dollars in loans and loan guarantees have been made available to Wall Street;

and that money, those loans, are just sitting in the Federal Reserve. They don't go anywhere; they never leave the banking sector. Currently in the United States, a great deal more of our GDP is attributed to finance than to manufacturing, for example. Therefore, money is just staying in the financial sector. With Glass-Steagall, we can force banks to get back into lending again. Investment banks can do what they want; but the only way a commercial bank is going to make any profit is by lending—which is what banks are supposed to do.


LLNL

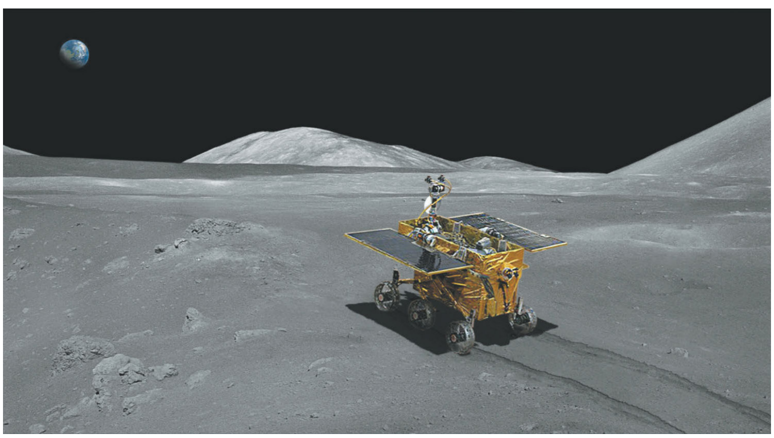
Laser fusion research at the National Ignition Facility at Lawrence Livermore Laboratory.

As a matter of fact, we need a national bank, in order to take advantage of opportunities for building infrastructure that doesn't create a direct return. We need a mechanism where an indirect payback is suitable for capturing the value created by building a new infrastructure platform. something that a national bank will allow us to do. As we direct credit to enterprises and ventures and infrastructure platforms, the metric is not a monetary one; it's a technological one. Are we increasing the energy flux density of the economy as a whole? Are we improving the amount of power available per capita? Are we improving the quality of power available per capita?

Think about the need to expand our control over space, for example. You can build as many windmills as you want all over the planet, but they will not get a rocket off the ground. Developing nuclear rockets gives us a whole new potential to redirect an asteroid coming our way, to therefore have a greater control over space, etc. So the metric is not monetary, it's technological. Last, we need a crash program to develop fusion power as the next platform of power as a whole for the human species. With this, we have the ability to control materials, to control water, to control power, to create artificial fuels—we can create methanol, for example, instead of gasoline. We can save our petroleum for use in plastics where it's irreplaceable. Instead of burning it, we can use it to make things. We no longer cut down trees on a mass scale for power; we save our wood for furniture—which you're not going to build out of coal.

So, I would just say that we should remove any problems—"inhibitions" isn't the right word. There's a lot of very wrong economic thinking that we need to throw aside. The whole monetarist idea of economics, for instance—that everything can be understood in terms of individual bits of profit that are added up, as opposed to looking at a platform that provides an incommensurable value to what came before. That kind of economic thinking has to be rejected, because if we stick with it, we will never be able to finance the kinds of projects that we need in the United States. If Trump says we need $1 trillion, the American Society of Civil Engineers says we need $4 trillion, if Chinese experts say $8 trillion, if an engineer at a conference I was at on Friday says $10 trillion, where is all of that going to come from?

It's not clearly going to come from purely attracting private investments. We need mechanisms that reflect the real value, the indirect value and the incommensurable value of infrastructure as a platform on which the entire economy rests. We need to invest dramatically in the scientific breakthroughs that will make that next level of platform possible; such as primarily research on fusion power. Thank you.



China's first lunar rover, Yutu (Jade Rabbit).

Engineering the 21st Century Silk Road

A summary of four presentations of the second conference panel, April 13.

by Brian Lantz

The conference heard from four highly qualified speakers of the second panel who provided their specific insights into China's high-technology infrastructure accomplishments and aspects of China's enormous Belt and Road Initiative. A summary of their respective remarks is included here, in the order in which they spoke.

The afternoon panel concluded with a statement from former U.S. Senator Mike Gravel (D-Alaska), who gave a ringing endorsement of the efforts of the Schiller Institute, and praised Lyndon and Helga LaRouche's irreplaceable work in initiating—and working tirelessly for—the New Paradigm, which encompasses the New Silk Road and World Land-Bridge.

China's Revolutions in Transportation

Professor Nie Lei, Dean, School of Traffic and Transportation, Beijing Jiaotong (Transportation) University (BJTU)

Professor Nie provided an expert's overview of China's highly advanced transportation system. Her School notes that it is "the birthplace of Chinese modern transportation education," with seven departments encompassing 29 research institutes and 39 specialized laboratories.

After Jason Ross's opening presentation, Professor Nie outlined China's revolution in transportation technologies and its emerging, national transport system. First, for her audience, Prof. Nie provided some brief context.

China's rapid economic growth began with the "Opening Up" policy initiated in the late 1970s, but by 1998 the primary reliance on the expansion of road and air transport was not sufficient to match freight and passenger transport needs, Prof. Nie explained. Crude oil, coal, steel, and wood was spilling over onto already crowded roads and highways; railway stations were "very crowded" with people; and China's cities completely lacked the subway systems that might help relieve growing urban traffic congestion.

It was in this context, she explained, that the central government decided to construct "a modern, comprehensive transportation system utilizing different transportation modes in a coordinated way."

As a result, to date, China's freeway system is now the largest in the world, at 130,000 km; high-speed rail (HSR) at the end of 2016 stood at about 22,000 km, first in the world; airline transport (passenger and freight) is second in the world; top-rated ports have been enormously expanded for domestic and international trade; pipeline networks now move oil and natural gas; and 25 of China's cities now have subway systems—again ranking China number one in the world, with 31 more urban subway systems under construction or in planning. And China continues to build out its integrated system, with plans reaching to 2030 and beyond. By the response of Professor Nie's American audience, one knew that they were mentally comparing China's profound transformation with the proverbial "potholes" of the decaying U.S. transport grid!

Professor Nie emphasized the advanced research, design, engineering, and construction involved in China's emerging "comprehensive" system. Nowhere is this clearer than in HSR, "which is very complicated," she noted. China has now built HSR lines that operate in the most extreme climates and over routes varying widely in climate and topology. Special HSR technologies allow trains to operate year round in a wide variety of extreme conditions.

The Lanzhou-Xinjiang HSR operates under conditions in which winds, on the Xinjiang Desert, reach 60 km per hour; the Harbin-Dalian HSR operates in temperatures ranging between 40 and – 40 degrees Celsius. These HSR trains are running at 200-350 km per hour. Similarly, China has developed the knowledge to build 9,000 km of bridges, carrying six rail lines, with HSR trains operating at 300 km per hour!

It is clear that China's scientists, engineers, and technicians have broken new ground in mastering high-speed construction, electrical multiple unit (EMU) traction power supply, operations management, and safety monitoring technologies, to name a few. Tickets? Ticket prices are one-third to one-quarter of those in Japan and Europe. Clearly, the potential of such creative breakthroughs inspired this American audience, both laymen and professionals.

The Potential of Bangladesh

Mr. Faiyaz Marshid Kazi, Counsellor, the Permanent Mission of Bangladesh to the United Nations

Mr. Kazi provided the considered viewpoint of a proud emerging nation, a player in the Asia-Pacific region. While this region is exerting increasing "gravitational pull" on the world economy, Bangladesh, "squeezed' between three economic powerhouses—India, China, and the ASEAN nations of Southeast Asia—has its own advantage of "geostrategic location," Mr. Kazi pointed out. The future of Bangladesh lies in "connectivity," as "the cornerstone of regional economic cooperation and integration."

Bangladesh therefore sees China's Belt and Road as "a grand, exciting initiative," reported the Counsellor. The Belt and Road Initiative intends to link "Central Asia, South Asia, Southeast Asia, and Africa, bringing Pan-Asian and Eurasian regional cooperation to a new level," building mutual trust and shared benefits.

Mr. Kazi highlighted the Bangladesh-China-India-Myanmar Economic Development Corridor (BCIM-EC) as a project that can link China's southern provinces to the sea and provide connectivity in energy, transport, and people among the region's nations. (This project was covered in *EIR*, June 24, 2016.) However, he explained, a major hurdle is to harmonize standards of infrastructure across the included nations, as Bangladesh and Myanmar "have a long way to go" to meet China's current, advanced standards. The BCIM-EC also has the potential to link with the East-West development corridor across Southeast Asia, now supported by the Asian Development Bank. (More on this below.)

Other initiatives referenced by Mr. Kazi included Bangladesh's collaboration with Japan, which is now developing the Bay of Bengal Industrial Growth Belt centered on Matarbari Island, where a major, integrated industrial city and trade hub is to be built. Other regional initiatives are also under way, including the Bangladesh-Bhutan-India-Nepal (BBIN) Initiative, and other projects restoring ties "broken since colonial times."

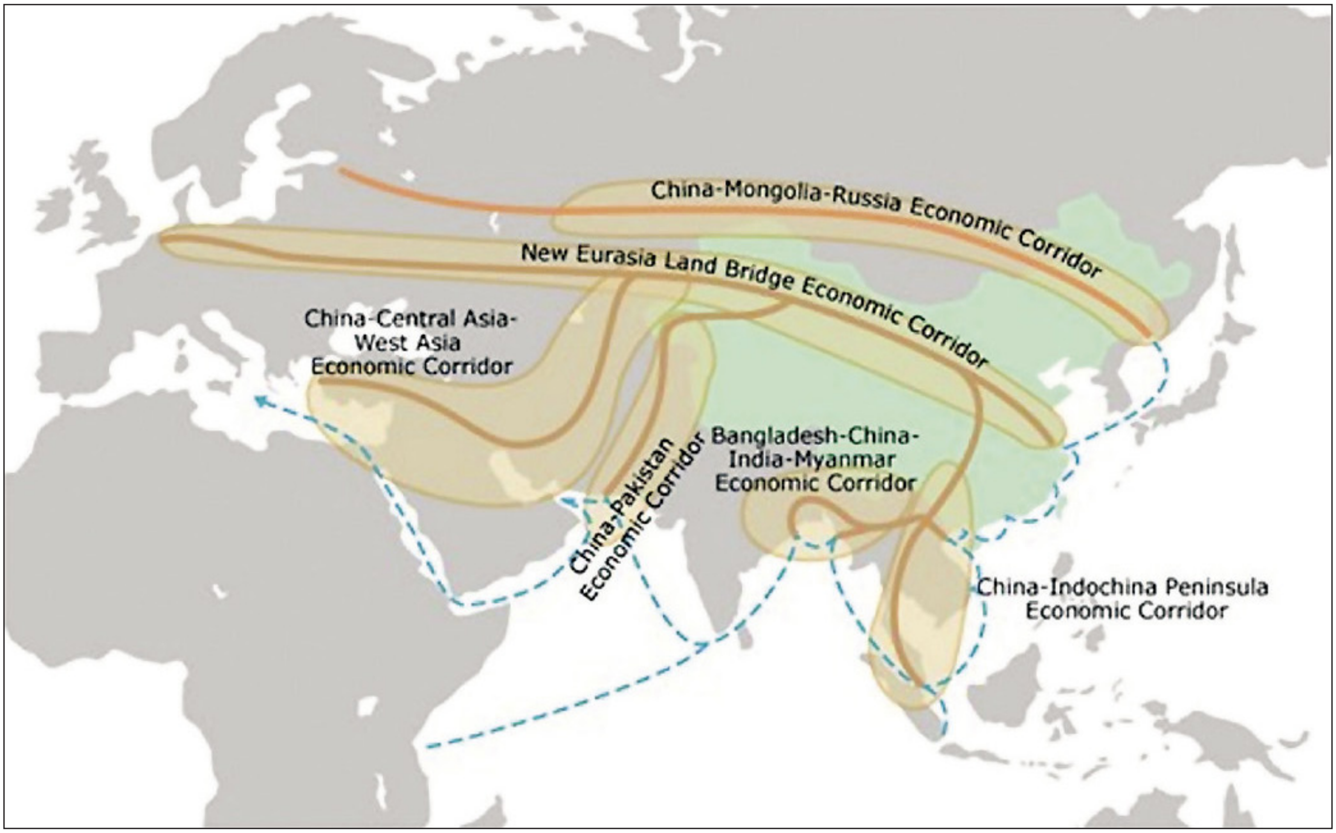
Contrary to western "green" perspectives, Mr. Kazi stated at the outset that Bangladesh views its growing population (now over 160 million in an area roughly that of Wisconsin) as a "demographic dividend," representing potential markets and developing productive potentials. Over 45 years, Bangladesh has reduced poverty from 80% to 22%. Overcoming the remaining impoverishment depends on "mainstreaming our economy into the regional economies all around" Bangladesh, he concluded.

Sustainability of the Belt and Road

Richard Trifan, Vice President, Government Relations and Trade, The Eurasia Center, Washington, D.C.

A rail logistics expert and promoter of Eurasian and Silk Road international trade with America and the European Union, Mr. Trifan spoke to the "global sustainability" of the Belt and Road Initiative, "of the actual infrastructure, the information flow, and the movement of goods, services, people, and trans-border crossings. . ." Mr. Trifan emphasized that it is not good enough just to build the New Silk Road—which he compared in its scope to man's effort to master outer space—but that, looking ahead, "the sustainability of the project will be paramount," given the enormous investment required. Perhaps the most important point of his remarks was that it will be up to each and every nation on the New Silk Road to ensure the the integrity of the entire system, and that sustainability requires "succession planning"—*a multi-generational* process, educating successive generations.

Companies and nations are quite capable of build-



The Belt and Road Initiative: six economic corridors spanning Asia, Europe and Africa.

ing out the complex of systems that are evolving, and the labor for that initial construction can initially be imported or domestic, or a combination of both, Mr. Trifan said. However, in his view, it is most likely that "responsibility for maintaining these systems over time will devolve to the respective nations through which they each pass"—be they rail, energy, or communications systems.

Mr. Trifan emphasized that this must be seen as a "huge impetus" for each nation's educational programs, and for all nations to collaborate to ensure that sufficient funding is available across the more than 40 nations now being connected. For the Belt and Road to last a specified life cycle—50 to 100 years is Mr. Trifan's assumption—the required levels of local education must be offered at universities, engineering schools, and secondary and trade schools.

These institutions must be aligned with the development of "design templates" across the system that ensure systematic inspections, maintenance, and required replacements on a timely basis, based on the life cycle of every component ("degradation planning"). These include rail guideways, signaling in all modes, information systems including satellites, border facilities, and similar planning in other areas such as energy systems, pipelines, and power grids. Issues of "common language" along the systems, building in of vendor warranties, etc., will require a centralized, collaborative decision-making process.

However, this is not a closed, static system. Transformations must be expected. Propulsion is an example. Full electrification, but also diesel, is being employed initially on railways. In the future, maglev propulsion will come into play, and must integrated and "synchronized." Here is the singular importance of proceeding, as Jason Ross developed in his opening remarks on the panel, with full recognition that increasing the creative capacities of peoples along the Belt and Road is both the source and intended outcome of creating mankind's New Silk Road and World Land-Bridge "platform."

As a delighted conference participant with long experience in banking commented, "Well, we're not just going to be holding hands and singing *Kumbaya!"*

New Proposals for Regional Cooperation

Dr. Liu Qiang, Director of the Energy Economics Division of the Institute of Quantitative & Technical Economics, Chinese Academy of Social Sciences (CASS), and Professor, Graduate School of CASS

Dr. Liu noted that he came from a small village and saw his first train when his family moved to a nearby town. Now, just 30 years later, he can even come to New York City, perhaps quite often. His point was that the Belt and Road Initiative is the "natural result of Chinese economic development." "This is the first time in human history that a big country transformed itself from a poor country to a rich country," Dr. Liu stated, "and this has a big impact on the whole system of the world." He sees this as the backdrop to the Belt and Road Initiative, so that now "China has enough capability to invest abroad, and to transfer our experience to the whole world, and also our lessons." This will create new markets for China, which has accumulated a huge capacity in industry and production, allowing China to produce higher quality goods for export, "and we can have common development of nearly half the population of the world," creating a more stable development of the whole world.

Dr. Liu then reviewed six proposals that he has been involved in making, in the context of the six development corridors of the Belt and Road. He began by outlining his proposal for the development of the "Northeast Asia power grid." China, Dr. Liu reported, now has a big power generation surplus, and he proposes to export that surplus to nations such as South Korea and Japan. Dr. Liu couched this proposal in terms of a "win-win" substitute for nuclear energy in the aftermath of Fukashima.

EIR notes that while the Northeast Asia power grid may be otherwise viable, a pragmatic, dollar-and-cents decision to substitute natural gas today for the benefits of nuclear energy technologies over the long run, would ignore the durable, "incommensurable" (to borrow from Jason Ross's presentation on the same panel), qualitative advantages of advancing a full nuclear energy platform for the Belt and Road. It would prevent the required increase in energy-flux density of power sources. Exactly such an exchange of considered views was central to organizing this very conference.

Dr. Liu explained that China is now working to solve the widespread problem of "dirty energy," energy sources and technologies that create smog over very large areas of China, particularly in November and December. "We have a big plan to substitute natural gas," he continued, with natural gas pipelines now coming from Russia and Central Asia, as well as liquified natural gas from Australia and Qatar—and even from the United States. China can thus develop as a major natural gas hub, in the near term. Clearly this view informs the current perspective of Dr. Liu's Energy Economics Division within CASS.

Dr. Liu outlined a number of additional major projects, which add more breadth and depth to what the Belt and Road Initiative encompasses. Dr. Liu has proposed a North Asia gas market, and also a Greater Central Asia power network, linking to existing grids and utilizing surplus Chinese power generation "to make a big market in the Middle East." Including Pakistan and Afghanistan in this grid, Dr. Liu added, "can have a very big benefit for peace of the world."

As an adviser to Pakistan Railways, he proposed the first rail line from Pakistan through Afghanistan to Turkmenistan and its modern city of Marv (Merv), which is also historically important as a city of the ancient Silk Road. A rail line westward from Gwadar Port to reach "large markets in Iran" has also been proposed to Pakistan.

Dr. Liu and his colleagues are also proposing an Indochina Peninsula power network, a project reaching into Laos, Vietnam, Cambodia, and Thailand, and intersecting other corridors along rivers such as the Mekong. Discussions are under way for HSR reaching from Kunming, China to the capitals of Laos and Thailand, which could then be further extended to Malaysia and Singapore. Energy will be a major requirement.

Dr. Liu Qiang explained that for these projects, if agreed upon, "money is not a problem. We have enough capital to invest," given real economic opportunities that can realize far more. The actual question, he said, is avoiding risks, "and maybe the political risks will be biggest . . . depending on the host countries." Yet the sense of his remarks in this regard was an optimistic one: These problems happen along the way, and can be overcome.

ENGINEER HAL COOPER

Long-Time Advocate's View of the World Land-Bridge Concept

Rail expert Hal Cooper addressed the Second Panel of the Schiller Institute Conference on April 13. He was introduced by Dennis Speed.

Hal Cooper

Dennis Speed: The ambassador from the United States to China, Anson Burlingame, whom Lincoln sent there, and people like Cassius Marcellus Clay, whom Lincoln sent to Russia, have dreamed of what the next speaker has illustrated and has believed in, and has taught for decades. I want people to understand whom they're hearing from right now. He has not just lived that dream; he has made that dream his life's work, and it's important that you understand that you are honored to hear from him. This is Mr. Hal Cooper, chairman of the Seattle Freight Transport Board.

Hal Cooper: I thank you very much. It's good to be back in New York. I grew up very close to here and it's nice to be back in New York City again.

[**Fig. 1**] This is connecting the Bering Strait and the Americas to the Belt and Road Initiative in Asia. This is a concept that really began a number of years ago. When I first joined the LaRouche organization back in 1991, we began talking about this concept [**Fig. 2**]. I think we pushed forward on that, and that of course, has led us to where we are today.

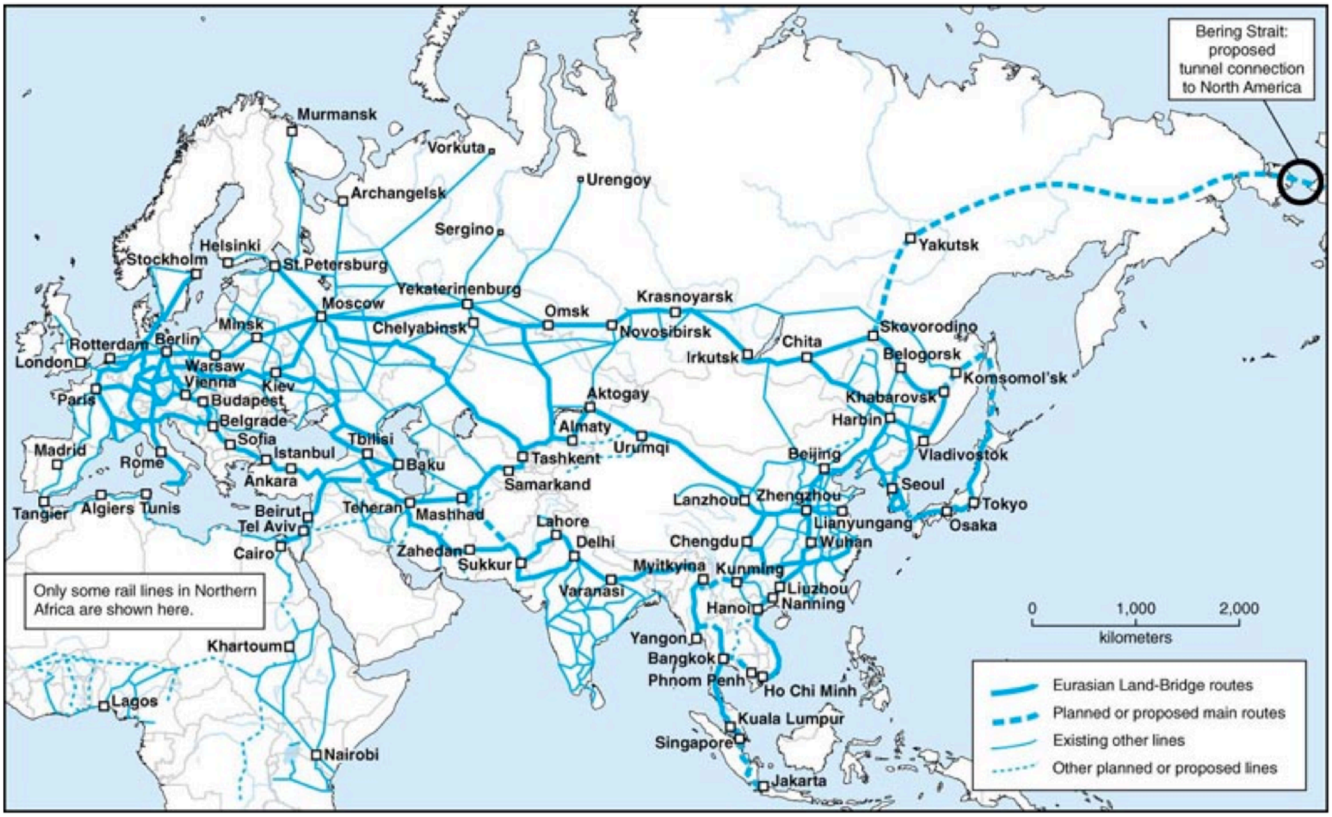
Helga, I'm very glad to have you here, *Guten Tag*. It's very good to have you here back in the United States. The last time we saw each other, we were in Germany. I'm very glad that the LaRouche Movement, and Helga and Lyn in particular, have pushed for this so much, and for so long, to really be thinking about beginning the implementation of the Eurasian Land-Bridge. We're so thankful that China and the other countries in Eurasia have jumped on board on this to make it a reality. It is certainly in the process of happening now.

This is "The Eurasian Land-Bridge" report of 1997, in which we printed the map of the network [**Fig. 3**]. This is Eurasia. There is certainly a dotted line going to the Bering Strait from Yakutsk. Actually, that line from Skovorodino to Yakutsk is basically a solid line. There

FIGURE 1

FIGURE 2

FIGURE 3



is agreement in Eurasia now to implement a very extensive transportation network which provides for economic growth and development. It is something that has to be extended to North and South America.

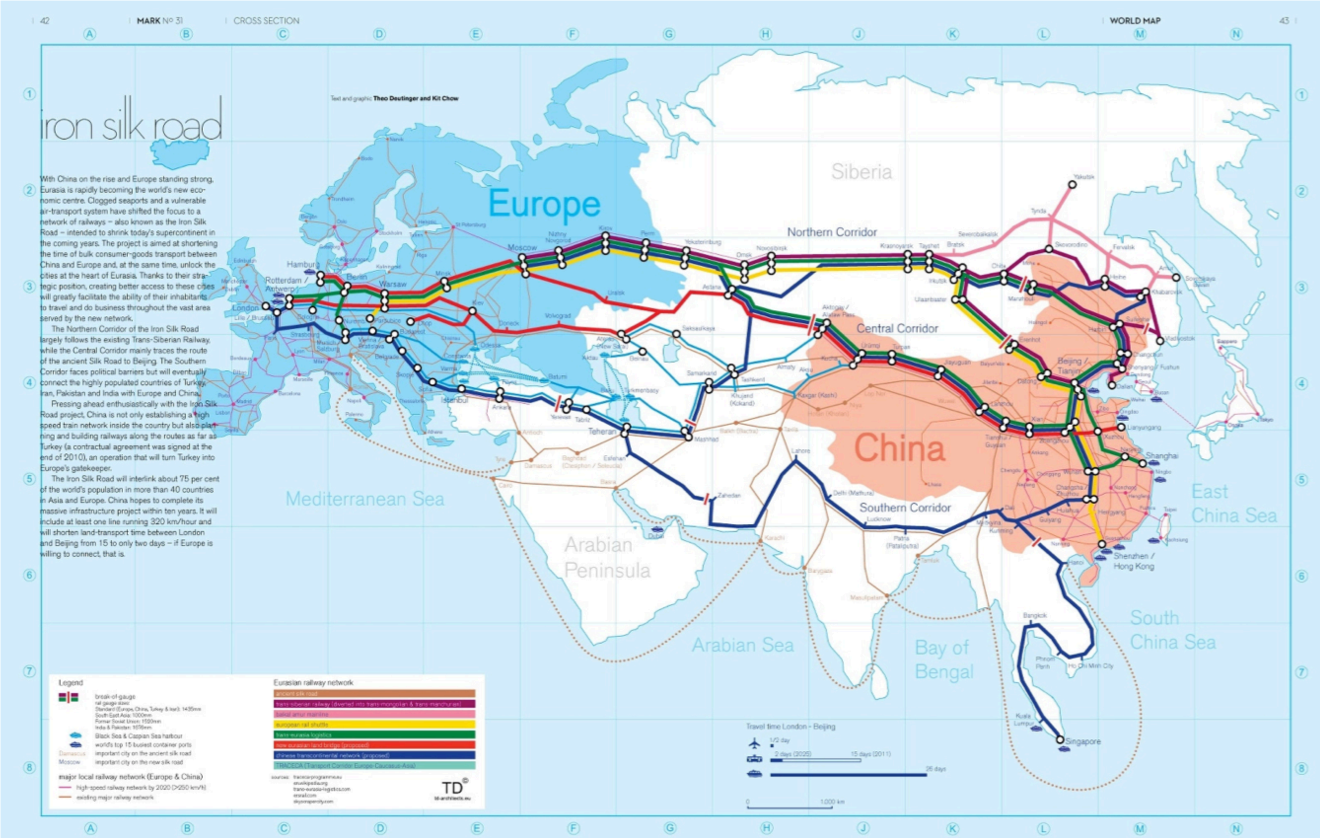
[**Fig. 4**] The Eurasian Land-Bridge concept is now in implementation. There are three major routes. There is the northern route which goes basically along the Trans-Siberian Railway. Then we have the Eurasian Land-Bridge from China, to connect to the Trans-Siberian Railway. Then we have the southern route—actually there are some other variations of that, and additional lines that connect. But you can see that there already is major interaction—a lot of traffic that is moving. We heard comments this morning of trains going between England and Europe and China. That is also going on along the southern route. There is traffic now between China and Istanbul in Turkey. I was in Istanbul in October 2008 for the international railway conference, in which a lot of this was getting started, and they had gotten to the point of talking about tariffs and things that require regulations. But the basic structure is now in the process of very much being put in place, and needs to be expanded—including to Africa and throughout the Middle East.

[**Fig. 5**] This is the World Land-Bridge concept and implementation based on the Eurasian Land-Bridge. Notice that is now connecting—or will connect—all of the world's continents. In the United States, we have to connect Alaska with Canada, and with the West Coast corridor. We need to connect back to the Midwest and the Eastern United States where the majority of the population and economic activity is. But we certainly do need the West Coast corridor.

There are three major infrastructure projects that need to be done. One, of course, is the Bering Strait tunnel. The second is the Fraser River Canyon, east of Vancouver, between Hope and Kamloops, British Columbia. Then, of course, the third is going down between Central and South America at the Darien Gap in southern Panama and northwestern Colombia.

[**Fig. 6**] The LaRouche Movement has published numerous documents related to the World Land-Bridge, in which this concept is actually presented in a way that really provides the pathway to bring it to reality. With their leadership, with Lyn and Helga in particular leading the charge on this, this is gradually becoming a reality, and of course, the very critical support of the government in China and the neighboring countries—which needs to

FIGURE 4



be extended through Russia to the United States. It's very important to connect the Bering Strait and the critical landmass between Europe and Asia, so that world development becomes Pacific-centered, rather than Atlantic-centered, which is based on stagnation as we're seeing, because of the London-New York axis, which unfortunately still has too much influence in the United States.

[**Fig. 7**] The idea of having a rail line and a highway between New York and London was actually proposed by Vladimir Yakunin, then President of the Russian Railways. That really locates the Bering Strait as the critical link. In this case, it would be going down through the prairie provinces of Canada from Alaska, through the upper Midwest of the United States through

FIGURE 5

The Eurasian Land-Bridge becomes the World Land-Bridge

FIGURE 6

2014 EIR Special Report:
'The New Silk Road Becomes the World Land-Bridge'
Translated into multiple languages, with more to come

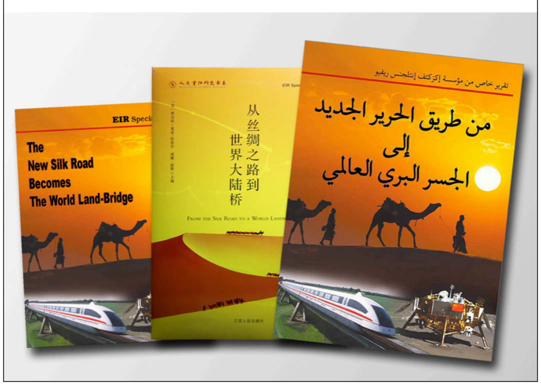


FIGURE 7

Graphic from 2015 CNN article: 'Drive from Europe to the U.S.? Russia Proposes World's Greatest Superhighway'

FIGURE 8

2015 article in *The Atlantic*, prominently featuring Dr. Hal Cooper's work with the LaRouches over decades

Minneapolis and St. Paul to Chicago, then east through Cleveland and Pittsburgh to New York. That would certainly be a long-distance and a long-term model which we need to implement, but there also need to be corridors going to the south along the West Coast as well.

[**Fig. 8**] There was an article that was published in the *Atlantic Monthly* in July 2015, in which I was interviewed, Mr. Yakunin from the Russian Railway was interviewed, as well as a gentleman by the name of Fyodor Soloviev from Alaska. We were all interviewed about the possibilities of building a Bering Strait Tunnel. There was also an alternative bridge, although with the meteorology there, that might not be the best way to go. But certainly there is a basis for connection.

[**Fig. 9**] I commissioned Craig Thorpe to do a painting of what the Bering Strait Tunnel would look like if it were to be built. This is the eastern entrance of what the tunnel would look like, near Whales, Alaska at the end of the Seward Peninsula, as a three-track line. Then it would have passenger trains and freight trains, including a Russian locomotive hauling oil. There are considerable minerals in Alaska—coal, potash, oil, etc.—a lot of which could be hauled by rail.

Then, of course, there's the development in parallel on the Russian side in Chukotka. There is an orderly plan that's well underway in Russia, going between Skovorodino and Yakutsk, which is basically completed now. Except they need to figure out how they're going to get to Yakutsk from across the Lena River, which is anywhere from three to twenty miles wide. Then, going to Magadan on the coast, then going up to Evensk, where they could go to the Kamchatka Peninsula and finally going out to the Bering Strait near Uelen in the Chukotka region.

[**Fig. 10**] A critical part of this project involves the West Coast of the United States. These centers of the United States, being an increasingly important financial and technological region, need to be connected. We need to have a line coming down from Vancouver

FIGURE 9

Artist Craig Thorpe's Depiction of the Bering Strait Railway Tunnel

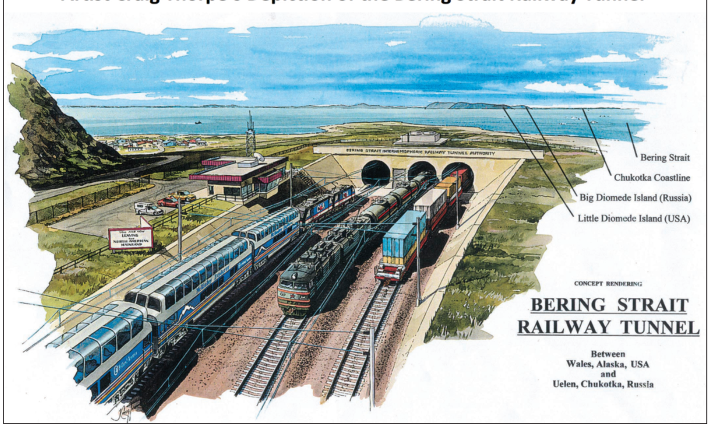


FIGURE 10

FIGURE 11

Artist Craig Thorpe's depiction of the California High Speed Corridor, featuring the "Grapevine Tunnel"

FIGURE 12

to Seattle, to Portland, to Grant's Pass, Oregon. Then we need parallel lines going down through the Sacramento Valley to Sacramento, and then along the U.S.101 corridor through northwestern California from Eureka down to Santa Rosa. And then a tunnel under San Francisco Bay into San Francisco, to connect to where the terminal is, which would also connect to California's high-speed rail project which does need to be built. I understand it's in President Trump's infrastructure plan, but it needs to get implemented and it needs to get built. We need a line down the coast as well as in the valley. We also need a line along the west side of the San Joaquin Valley in parallel to the California Aqueduct water course.

[**Fig. 11**] This is a picture of what a tunnel under the Grapevine would be, which is the grade south of Bakersfield to Los Angeles. It would require building a tunnel 32 miles long, very similar in concept to what has just been completed for the St Gothard Tunnel in Switzerland, which is 53 miles in total, with the main tunnel being 37 miles long. This would be very similar in concept, very similar in implementation, and it solves a big bottleneck.

I should tell you that the Desert Express privately financed high-speed rail line between Las Vegas and Palmdale that would connect to the California high-speed rail project going out through the Antelope Valley between Palmdale, Lancaster, and Mojave, would connect. Then you would have two parallel lines to Los Angeles: One over Soledad Pass, and one through Tejon Pass into the San Fernando Valley into Los Angeles.

[**Fig. 12**] This is northern California. This is Mount Shasta, for those of you who have not recognized it. I show a maglev line and also a high-speed conventional line which would have both passenger and freight trains. I would like to see that modified so that instead of the old Southern Pacific colors, we had two new high-speed trains: one with the California high-speed rail color, and the other being the Amtrak Cascades which runs through the states of Oregon and Washington.

[**Fig. 13**] Now, we need to extend the system down into South America from the United States, and that's going to mean going through Central America, through Mexico, Guatemala, Honduras, El Salvador, Costa Rica, Nicaragua, and Panama into Colombia. The Darien Gap is a formidable area and there's

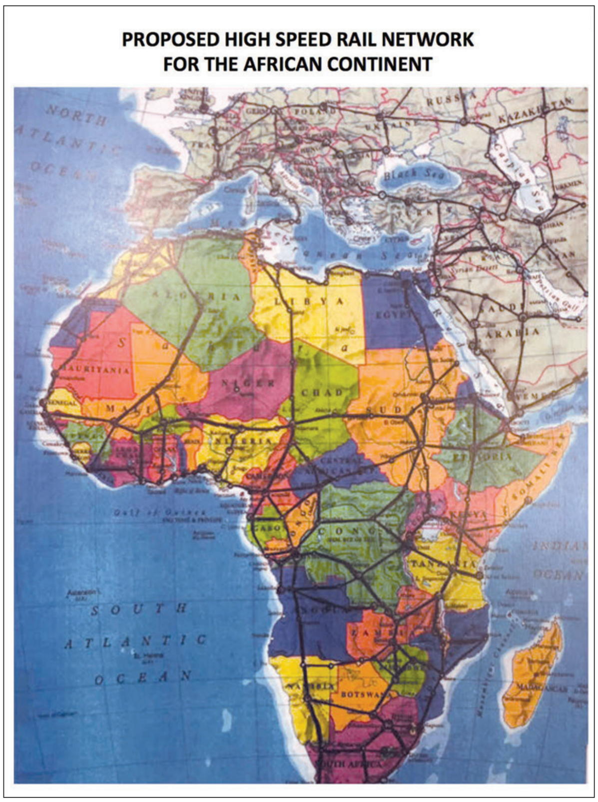
FIGURE 13

FIGURE 14

a big swamp there. The best way to do it is to build it on the mountain foothills to the east and then have a bridge over the Gulf of Urabá—right there in far northwestern Colombia—to a place called Turbo, and then south. It would ultimately go to Bogota and other cities in Colombia and south into Ecuador and Peru. Then, connecting with these bi-oceanic railways that are now being proposed across South America, including the presence of the Chinese both in the northern and southern route through Bolivia, Brazil, Peru, and possibly Chile. There's a separate one between Argentina and Chile.

[**Fig. 14**] I'm showing you one of the northern routes for the proposed bi-oceanic rail system in South America, plus the LaRouche proposal for a railway network in South America which certainly needs to be built. We need to get rid of the political opposition that has attempted to prevent it in the past, as has been extensively discussed already at this conference.

FIGURE 15



[**Fig. 15**] This is the proposed rail network in Africa. I did an extensive feasibility study several years ago about a featured rail network in Africa which could connect all the countries. The Chinese basically have proposed doing the same thing for a major high-speed rail system in Africa, starting between Durban and Johannesburg in South Africa.

And I think we're done. Thank you.

From the New Silk Road to Space: LaRouche's Economic Platform Concept

by Benjamin Deniston

Benjamin Deniston, a member of Lyndon LaRouche's Scientific Research Team, concludes the Second Panel of the Schiller Institute Conference of April 13-14 in New York.

Benjamin Deniston

We've gone through a lot. I would like to take a few minutes to step back and again review the New Silk Road and its expansion into the World Land-Bridge, and re-examine all of it, and all its details, from the standpoint of Mr. Lyndon LaRouche's science of physical economics.

As my colleague Jason Ross discussed at the beginning of this panel, economics is not about money, and it's not about market analysis, or goods production *per se*. Rather, you're looking at the science of how mankind progresses in a completely unique way. Economic progress is a uniquely human characteristic. It is the expression of the absolute distinction of humankind from animal species. Any animal species has a fixed ecology, a fixed relation to its environment, a fixed ecological characteristic. But humankind does not. Humankind is characterized, in its most fundamental essence, by revolutionary transformations and up-shifts in its relation to the environment—transformations created by humankind itself. (This is why the decarbonization and green energy fraud is so dangerous. Carbon dioxide isn't a problem, and solar and wind power simply can not support the necessary advance of humankind.)

A New Concept of Infrastructure

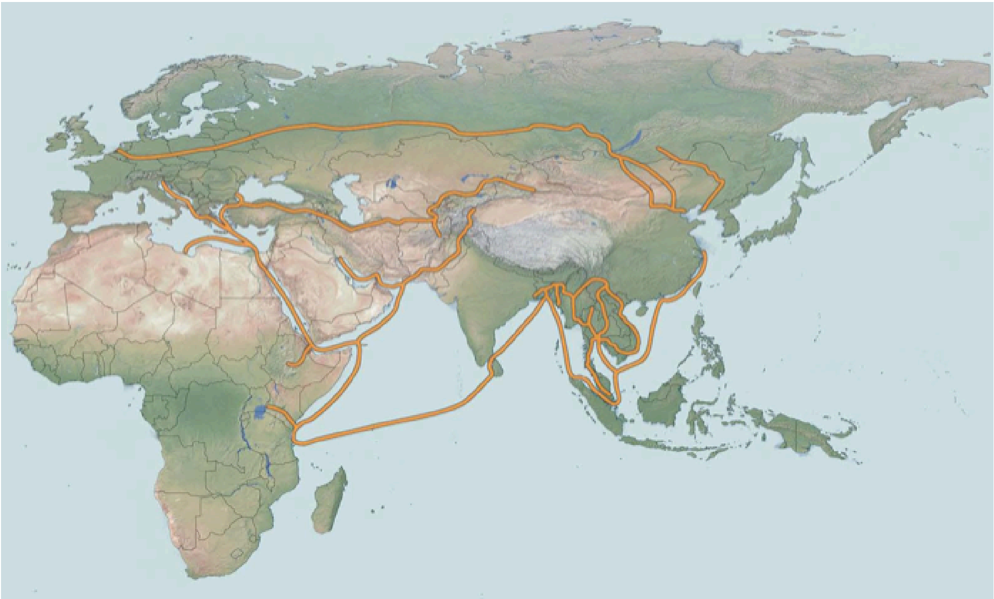
LaRouche's science of physical economics allows us to view the New Silk Road and World Land-Bridge as a particular stage in the larger process of human creative development.

A quick way to visualize this is to look at pictures of the Earth at night [**Figure 1**].

As indicated by the locations of the lights, we can quickly see that much of the world population, and its economic activity and development, still resides near the coasts—about 40% living within 60 miles of a coast. About 40% of the population lives within perhaps 10% of the area of the continents. An interesting perspective. There are vast interior regions of continents with little or no economic development and very low population den-

FIGURE 1

FIGURE 2
The New Silk Road



sity. The interior regions that have been developed are most often associated with rivers, waterways, and raillines—but we'll get into that shortly.

We see here the New Silk Road [**Figure 2**]—currently composed of six land routes plus the maritime component—which brings new densities of infrastructure development right through many interior regions throughout Eurasia. Many of its routes penetrate through these landlocked, inland regions.

As envisioned by Lyndon and Helga LaRouche, this does more than simply connect existing population centers. It also brings the potential for the development of interior regions in completely new ways. In effect, it enables these inland regions, these landlocked territories, to become as productive, or even more productive, than the coastal regions have been historically.

This goes further with the full expansion of the New Silk Road into the LaRouches' vision for the World Land-Bridge [**Figure 3**]. This will enable the full global development of the interior continental regions—creating the conditions for interior regions to become more productive, and more dense with population and economic activity, than the coastal regions have been.

To appreciate the principle behind this, requires a new conception of infrastructure, rooted in Mr. LaRouche's science of economics—in particular, an understanding of what infrastructure really means, as the synthetic, man-created environment that Jason Ross spoke about earlier. A synthetic platform for higher levels of civilization. The creation of higher-order such synthetic platforms.

History of Human Development

Recognizing that most people's conception of infrastructure fell far short, in 2010 Mr. LaRouche introduced this concept of the economic platform.

In his April 2010 paper, "What Your Accountant Never Understood: The Secret Economy," Mr. LaRouche wrote,

> We should then recognize that the development of basic economic infrastructure had always been a needed creation of what is required as a "habitable" development of a "synthetic," rather than a presumably "natural" environment, for the enhancement, or even the possibility of human life and practice at some time in the existence of our human species. . . .
>
> Man as a creator in the likeness of the great Creator, is expressed by humanity's creation of the "artificial environments" we sometimes call "infrastructure," on which both the progress, and even the merely continued existence of civilized society depends.

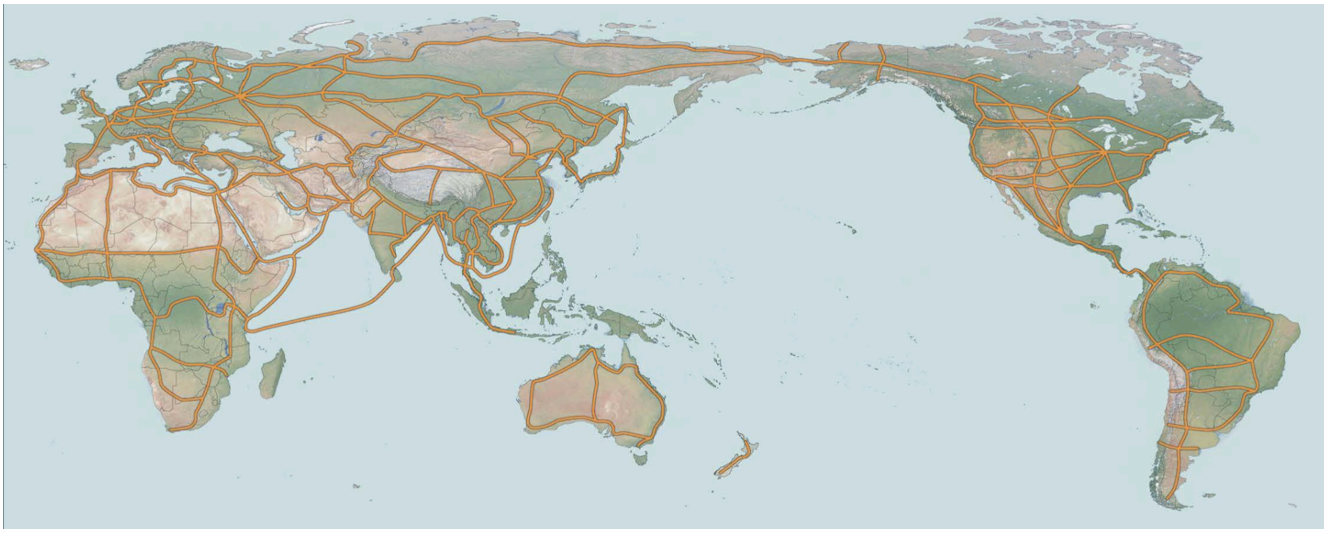
Mr. LaRouche went on to redefine the history of human development from the standpoint of a succession of economic platforms.

Celestial Navigation to High-Speed Rail

Going way back, tens of thousands of years, we have ancient, prehistoric civilizations based on transoceanic maritime culture—stretching back into the last ice age, before the interglacial melt. In this early maritime economic platform, advanced civilization's relation to the natural world—mankind's ecological characteristics, so to speak—was limited to certain coastal regions, and navigable rivers.

FIGURE 3

The World Land-Bridge



And this relation wasn't simply based on the technologies of, for example, ship-making—it was ultimately based on a fundamental level of scientific discovery, and associated cultural development. This centered around the creation of advanced star-maps of the night sky—including understanding various cycles of long-term motions. This required rather sophisticated levels of early scientific insight, to map one's position in space and time from tiny changes in the star-map, projected back onto Earth.

This sky-map was the first infrastructure platform, supporting a new stage of humankind's relation to the planet—freeing these cultures from a local existence and enabling transoceanic civilization.

The next great revolution was the development of canal systems, linking major rivers into integrated systems of inland waterways. In European history, Charlemagne was the great pioneer of this program. This enabled the development of inland regions in a completely new way, with road systems adding supplementary support.

Then we have the development of railroads, and especially transcontinental rail systems. Here the pioneering effort was led by the United States of John Quincy Adams up through Abraham Lincoln's great transcontinental railroad.

In effect, artificial rivers of iron and steel now brought civilization deeper into—and across—inland regions, in ways not possible before.

Regarding technologies, that step was enabled by the development of heat-powered machinery and engines.

Regarding science, this economic platform is intimately connected with the development of a new level of physical chemistry, based on the periodic table of elements, and with the sciences of understanding heat, energy, and thermodynamics.

All of this, again, was humankind creating a new, higher-level synthetic environment, supporting new levels of population, living standards, and happiness.

And this takes us to the location of the New Silk Road and the World Land-Bridge, in this context.

Electrified, high-speed rail, especially magnetic levitation rail—with air travel and highways playing a subordinated role—is a higher platform, allowing mankind to conquer entire interior land-masses in a way not possible before.

This does not involve transportation alone. New power sources are an integral part of it, requiring nuclear power for rising levels of energy-flux density, and soon fusion power. It includes large-scale water systems, desalination, and weather control. The amazing Chinese "South Water North" project is an integral part of this, and the new interest in the Transaqua program in Africa to refill Lake Chad—continental water management.

Together with the associated communications, education, and healthcare, the World Land-Bridge as a platform creates the next level of synthetic environment for the growth and progress of humankind.

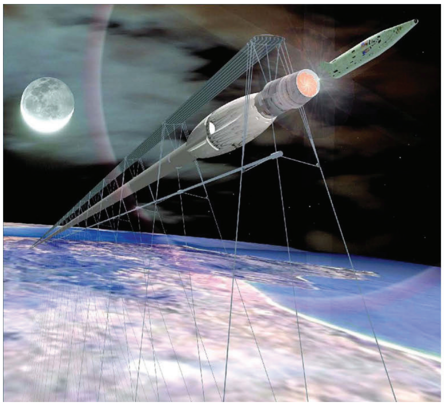
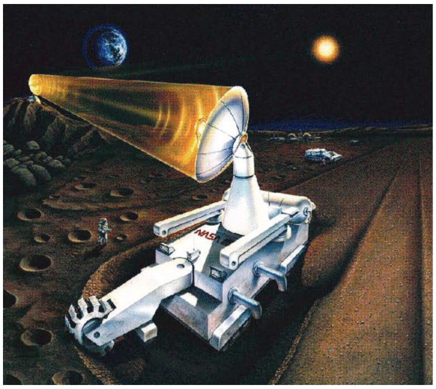


Illustration of space-launch device using maglev propulsion in a vacuum tube.

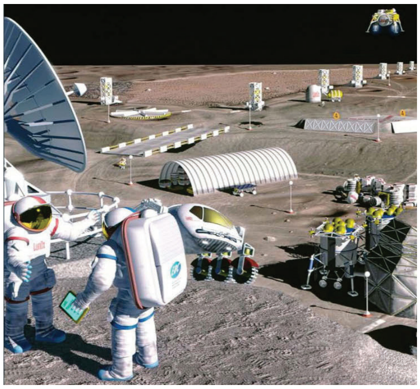
NASA

"Scramjet" style space plane.



University of Wisconsin, Fusion Technology Center

Illustration of Helium-3 being mined on the Moon.



NASA

Illustration of development on the Moon.

Its level of science is that broadly associated with the fundamental discoveries of Albert Einstein and Max Planck—the understanding of quantum and nuclear processes, electromagnetism, and space-time.

So we see the New Silk Road and the World Land-Bridge not simply as "infrastructure," as most tend to understand infrastructure today, but as the next stage in the natural development of mankind as a uniquely creative force, mankind as a creator.

Returning to the pedagogical distinction of humankind from the animals, each of these shifts is like an evolutionary species transition—a revolutionary transformation of humankind's ecological characteristics, or its relation to the natural world.

But for humankind this transformation is not biological or physiological, as it is for animal evolution—it is based upon humankind's unique capability for creative scientific discovery and cultural advance, the unique characteristics of what makes mankind mankind. It is this type of revolutionary advance which is the most characteristic feature of mankind. It is a change no animal species could ever accomplish.

Humankind isn't defined by any particular platform or technology or culture, but only by the ability to continually self-create higher levels for humankind.

The Next Great Challenge

Therefore, the World Land-Bridge isn't an end in itself, but another step in the ongoing process of mankind's endless progress. And we must look to the next steps to come after, which are in space. We should expect to go on to develop a platform of human economic activity in the Earth-Moon system. To go beyond visiting and exploring the Solar System, to actually begin real human economic development of the Solar System, beginning with the Moon, and looking towards Mars.

We envision developing the infrastructure to support making travel in the Solar system as easy as travel now on Earth. Fusion propulsion can reduce travel times to Mars from months to weeks—or perhaps to mere days. Reusable "scramjet"-style space planes, or space-launch devices using maglev propulsion in vacuum tubes, could vastly reducing the cost of travel into Earth orbit. A next step is to develop resources on other planetary bodies, rather than having to take everything with us from Earth. For example, to mine Helium-3—perhaps the best fusion fuel—on the Moon, and develop basic infrastructure on the Moon and other planetary bodies.

These define some broad categories. Coming out of our work on the Silk Road, we should be thinking about the future next steps, when we can look forward to transforming man's relation to space, in the same way we are transforming our relation to the interiors of continents.

We should recognize that only this process of continual, successive development—in which every generation is engaged in new, revolutionary challenges—can make us satisfied with our human existence.

III. Mathematics Is Not Science

A Fusion-Driver Crash Program: Upshifting the Human Species

The following class was presented by Megan Beets, a leader of the LaRouche Science Team, to an audience in the New York metropolitan area on April 15, 2017.[1]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Lyndon LaRouche in Berlin, 2002.

My name is Megan Beets. I'd like to welcome all of you to the tenth in our series of classes on LaRouche's Physical Economics. I'd like to begin with what I think is a familiar idea to those of you who have been attending this class series, which is our theme for today: that is that the creative human mind is an absolutely unique form of existence in the universe. This mind, this process of creative thought, distinguishes human beings as a type of living being, which is not only a living being, and it sets us absolutely apart from and above all other forms of life. Human beings can consciously and willfully think and invent in such a way that we're able to more and more comprehend the process which organizes the physical universe around us, and to participate in and contribute to the ongoing upward development of that universe.

Now, this was recognized by all of the greatest thinkers in history, just to reference a few: Johannes Kepler, Plato, V.I. Vernadsky, Einstein, Bach, Beethoven; and especially Lyndon LaRouche, who made his own discoveries in the science of physical economics, basing those discoveries on exactly this unique power of the creative human mind and the creative human imagination. This LaRouche defined as the science of Physical Economy, as a science and study of the upward progress of mankind and the promotion of the upward progress of mankind. Mr. LaRouche himself has made fundamental contributions to the understanding of that process.

I would like to address this theme using a very specific example that LaRouche calls for, in the fourth law of his "Four New Laws to Save the U.S.A. Now."

This fourth law is titled, "Adopt a Fusion-Driver 'Crash Program,'" and it begins, *"The essential distinction of man from all lower forms of life, hence, in practice, is that it presents the means for the perfection of the specifically affirmative aims and needs of human individual and social life. Therefore: the subject of man in the process of creation, as an affirmative identification of an affirmative statement of an absolute state of nature, is a permitted form of expression."*

Now, Mr. LaRouche follows that up, his Four Laws, with this statement:

"The knowable measure, in principle, of the difference between man and all among the lower forms of life, is found in what has been usefully regarded as the naturally upward evolution of the human species, in contrast to all other known categories of living species. The standard of measurement of these compared relationships, is that mankind is enabled to evolve upward, and that categorically, by those voluntarily noëtic powers of the human individual will."

Now that is the most important concept in economics. As people know who watched the April 1st presentation that was given by Ben Deniston, he referred to

1. A video of this class is available here.

the increasing rate of energy-flux density in the biosphere over the course of the evolution of life, and he referenced the idea, or the fact, that mammals, as a type of animal life, demonstrate a higher energy-flux density than reptiles, and reptiles over amphibians, and so forth, such that the increase in metabolic action and the increase of action per lifetime of mammalian species is a category above lower forms of life.

But now what about human? If people think about human metabolism, what we metabolize via our bodies is not all that impressive, compared to other forms of life. Most of human metabolism is external. Most of it is via technology, via society. For example, we metabolize *tremendous* amounts of steel, of coal, of copper, of zinc. And the per capita metabolism of these substances is *enormous*, incomparable with any other form of life.

The most important fact about human metabolism and human energy-flux density is that, yes, it's superior to mammals just as mammals are superior to reptiles, but it's not fixed. We can willfully upshift our interaction with the physical universe and revolutionize it. This happens with the introduction of a new discovery of principle, something generated by the human mind, which gives us power in and over the physical universe, to do things we simply could not do before. Our relationship to the physical universe is completely transformed in a way which is exactly comparable to a difference in species, a categorical difference in species. So if you think about human species five hundred or one thousand years ago, and you think about how you might describe the human species in a biological textbook and list the average lifespan of a human being, you list where we're able to live, you list the average population density, the kinds of resources we utilize, the kinds of structures we build, if you made that list for human beings of five hundred years, it would be completely different than the list or the description you would make of the human species today.

Making that kind of shift intentionally, is what the fusion driver crash program that Mr. LaRouche calls for is about. With the mastery of fusion we will realize full control over the atomic nucleus, something which has been a potential at our fingertips for over half a century. We will move mankind, finally, and fully, into the atomic age. Meaning this: Meaning that our relationship to matter will be transformed from a mode of a simple redistribution and recombination of elements, as it is today, and will move into a mode of the creation of elements, of the generation of elements.

Now, we already do this today on limited scale. With fusion, we will be enabled to do this on a large scale to the point that this will characterize the human species.

Understanding and Mastering Physical Processes

Now, a few things before going further. I know most people have seen little cartoons of atoms in their science textbooks, of little balls surrounded by other little balls. The universe is not composed of particles. There's no such thing as tiny, hard little balls which somehow interact with all of the tiny particles around them, and all of their little interactions somehow add up to a coherent, creative universe, which contains life and human creative thought. *That's not how it exists*.

Matter is as little composed of tiny particles, as music is composed of notes, or as poetry is made up of words. What we think of as words, or notes, or particles, are merely singularities within a particular geometry, which is the manifestation of a principle of action.

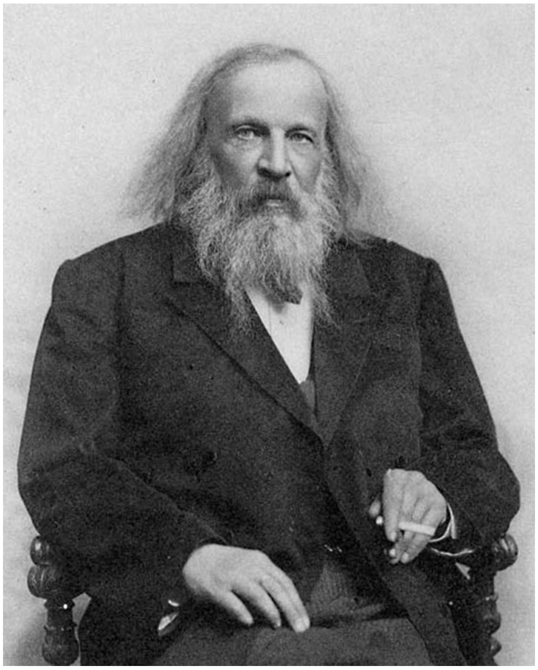
I want to give what I think is an example on a slightly simpler level but I think it gets at the point, and I think this might even be an example that was given by Mendeleyev, though I wouldn't vouch for that. Take a chemical compound which you know well: Water. Now, everyone learned that water is composed of hydrogen and oxygen. Now, hydrogen and oxygen are colorless, odorless, highly flammable gases. Right? What about the characteristics of hydrogen and oxygen when they come together, to become liquid water, which is the most essential thing for life? There's nothing characteristic in the parts that can predict the characteristics of the chemical compound that they create together. So, hydrogen, in the context of a water molecule, is completely different than hydrogen in its free form.

Now, it's important to make that statement, and not just because I know people, myself included, have these science textbook cartoons in their heads, but also because this is the way that people like Antoine Lavoisier and Dmitri Mendeleyev thought. Lavoisier and Mendeleyev bookended the roughly hundred-year development of modern chemistry. Lavoisier lived at the end of the 18th century [1734-1794], and he isolated as chemical elements, oxygen, nitrogen, for the first time, carbon, hydrogen, and so on, and determined that these were differentiated chemical elements which could not be made more simple. And he did this based on experimentation on their characteristics of action. There could be whole other classes on Lavoisier's work; Lavoisier founded modern chemistry.

Mendeleyev lived in the middle to end of the 19th century [1843-1907], and Mendeleyev discovered the unique harmonic ordering of the entire set of chemical elements that Lavoisier had first begun to discover. You all are probably familiar with this, the Periodic Table of Elements.

Mendeleyev's harmonic ordering of the periodic table was able to predict both the existence, but also the characteristics of chemical elements that hadn't even been discovered yet. Mendeleyev's first periodic table was proposed in 1871.

Almost immediately, within the last three decades of the 19th century, the completed discovery of the domain of chemistry by Mendeleyev, opened up into the discoveries of the nuclear age. In the decades of the 1880s and 1890s, you had the work of people such as Wilhelm Roentgen, Henri Becquerel, Paul Villard, Pierre and Marie Curie—and many others—whose work led to the discovery of the electron, the discovery of the proton, the discovery of the nucleus, of X-rays, the discovery of gamma rays; the discovery of radioactivity.



Public Domain

Dmitri Mendeleyev, frontispiece from Fundamentals of Chemistry *(1897).*

These initial discoveries began to unlock a completely new domain of the nucleus and the powers associated with the nucleus. This was a complete revolution in science. This also formed the background and the context for the work of people such as Albert Einstein, including Einstein's idea that a very small amount of matter was equivalent to a very, very large amount of energy. This intrusion of the nucleus, including all of its bits and parts, completely challenged and overturned the previously held assumptions of the chemical era, for example, the law of the conservation of mass and the law of the conservation of energy.

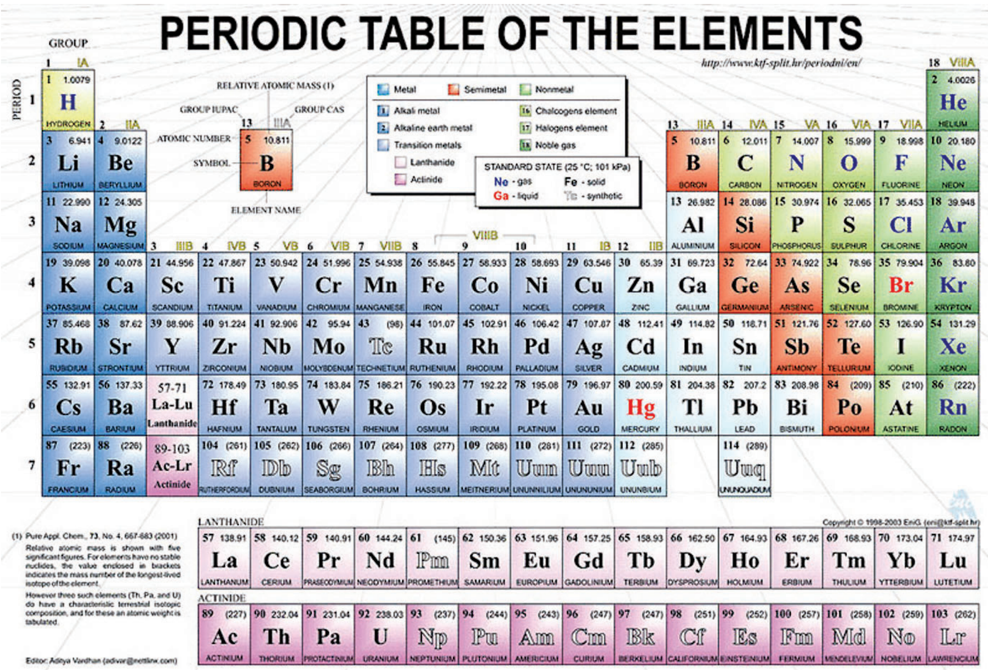
To give a quick illustration or example of that: If you take a water molecule and you split it into its constituent parts of hydrogen and oxygen, the mass of the hydrogen and the oxygen add up together to equal the mass of the water molecule. However, if you take a nucleus, such as uranium and you split that, the pieces that you end up with, if you added them back together, their mass is *less* than the mass of the original nucleus. Where did the mass go?

It was the phenomenon of radioactive decay observed by Becquerel, that challenged the idea of the conservation of energy. It seemed as if energy was coming out of nowhere.

So, this was a completely revolutionary period in human thought, and by the turn of the 20th century, you had the emergence of a completely new domain that nobody had ever imagined before, and which was completely invisible from the domain of chemistry, and chemical reactions.

By the early 1930s, you had the work of James Chadwick, who discovered the neutron. You also had in 1934, the first artificial radioactivity, and with this, came the idea that perhaps human beings can intentionally transmute elements. Perhaps human beings can change one chemical element into another. So if we go to the Periodic Table, you see on the top right the N and the O, standing for nitrogen and oxygen. In 1919, which is a little bit earlier than this, you would have the first intentional transmutation of nitrogen into oxygen, demonstrating that the Periodic Table was not a set of fixed categories, but it was actually a much looser domain that we could begin to move around in; we could begin to change one thing into another, and exert a certain amount of freedom over matter.

Work went on in the early 1930s, into the middle of the 1930s with transmutations, where scientists Otto Hahn, Fritz Strassmann, and Lise Meitner were bombarding elements with neutrons, trying to induce transmutations. In the bombardment of uranium, something very interesting happened. The expectation was that bombardment of uranium with neutrons would create an element one or two steps up on the Periodic Table. The problem was, that didn't happen. The bombard-



Wikimedia Commons/user:Kabirhridoy

ment of uranium generated products that were much, much further back on the Periodic Table, about half of the atomic weight of uranium.

This was the first emergence of fission: Fission power, or the phenomenon of fission. Most people's association with fission, if they have one, is of nuclear power plants; fission power to produce electricity, where we intentionally create nuclear chain reactions in uranium fuel, which generates a tremendous amount of neutrons, a tremendous amount of heat, and we use that to boil water, turn turbines, and create tremendous amounts of electricity.

Fission Power and Physical Economy

Now, this is an incredibly important use of the fission process. The energy locked up in the nucleus is more than a million times the energy in the chemical bonds. Think about that—something that is a million times more energetic than the previously used fuel. To put it another way, it takes 2.7 million pounds of coal to equal the potential energy in 1 pound of uranium. This is a complete revolution.

Imagine the needs of a population of 7.5 *billion* people, people whom we intend to uplift to a modern standard of living: the electricity requirements of these populations are overwhelming. The idea that we could supply those needs with a small amount of uranium, rather than millions of tons of coal or oil toted around the world every year, is incredible. And that's why most nations in the middle of the 20th century were running for nuclear power—and they would have had it, except that it was shut down by a British operation, which was deployed in the form of the environmentalist movement; it was deployed in the form of globalization, and globalist economics; and it was deployed in the form of coups to overthrow the leaders of nations who wanted this kind of development.

This sabotage has led to a condition where, today, only 31 out of roughly 200 nations on the planet use nuclear power. We have to increase this very quickly.

Electrical power is an incredibly important use of fission, but fission is not just an energy source. Put much more precisely, fission, or fission reactors, are atom producers, atom factories. And before I give a couple of examples of what I mean by that, I need to refer to an aspect of the Periodic Table which I skipped over a moment ago, which is this: In around 1910, in experiments that were being done on the decay of uranium, the natural radioactivity of uranium, it was discovered that in the process of giving off gamma rays and other particles, uranium is naturally transformed into different elements of lower atomic number.

So this was being studied in 1910, and it was identified that during that process of the decay of uranium, this yielded elements which were chemically identical with other elements of the Periodic Table, meaning that we started with uranium, then at some point we ended up with something that behaved chemically just like another element on the Periodic Table. It would enter into chemical compounds the same way; if it was mixed with that element you couldn't separate it chemically by any means. *However, it had very, very different physical and radioactive properties*. For example, the ionizing energy, the amount of energy it would take to ionize that element, was different than its chemical twin. The magnetic characteristics were different than its chemical twin; its half-life was different from its chemical twin. The half-life is the amount of time it would take for half of a sample of that element to decay, to go through a radioactive decay.

Why? There was nothing in the domain of chemistry that could explain this. So, it was in 1910, I believe it was Frederick Soddy who named chemical twins "isotopes," coming from the Greek to mean "same place," as in, they are in the same place on the chemical Periodic Table, although they exhibit different properties. There are two different types of oxygen. There are three different types of carbon, all of which are chemically identical, but different in other ways.

This added a completely new dimensionality to what we had perceived to be the chemical elements in the past. A few years later, it was confirmed that the isotopes of a single element had different atomic weights, and today we have over 3,000 known isotopes most of which are manmade, and we regularly use 200 of them in human economics.

Here's an example I want to give, which some of you may probably be familiar with—the term "medical isotope." A medical isotope is something that we use for medical imaging and diagnosis. People who have had MRIs, you drink a little potion that has a medical isotope in it which is able to respond to a magnetic field. We use these things in medical diagnosis, medical treatments, cancer therapies and so forth.

Medical isotopes are just one product of a fission reactor. These things are produced inside fission reactors. Other kinds of isotopes that we can produce in fission reactors and other associated nuclear technologies, have very interesting properties which I don't have time to go into today, but to give quick examples: Carbon has a few different isotopes, and all diamonds that are found in nature are made of a mixture of these isotopes of carbon. However, if we create artificial diamonds which are only of one isotope or the other, they actually have different properties. One, either carbon-13 or carbon-12, I forget which is which, but one of these diamonds is much stronger and its more thermally conductive than the other. You have a similar case with silicon, and probably most of the elements of the Periodic Table.

Another example: the metal steel which is doped with certain isotopes to create a stronger metal than the original. The other thing I'll refer to, although we don't have time to go into it today, is that life, living bodies, living organisms, are extremely selective of their isotopes. We find higher concentrations of certain isotopes inside of a living body, than in the environment around it; an example is carbon-14 which is the radioactive isotope of carbon. It's more concentrated in living forms, than in the air around us. Vernadsky began a whole study of this, and much more needs to take place.

The point is that with our initial control over the atomic nucleus, as exhibited with the kinds of experiments that led to fission power, we began to have this finely tuned freedom over matter. We need to complete that: We need to have full control over the Periodic Table and over the nucleus.

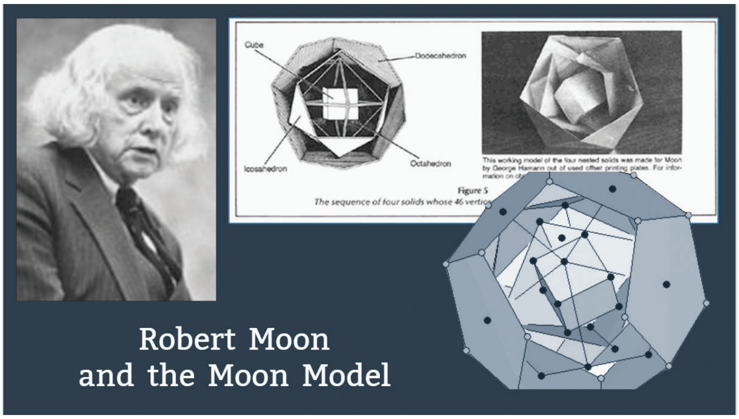
Fusion: Challenging All of Our Assumptions

I'm going to skip ahead to fusion. It was clear very, very early on, that the energy which could be attained by the fusion of chemical elements was many times greater, up to one hundred times greater than the fission of elements. If we think about fission again, for a moment, as opposed to transmutation, where we move through the Periodic Table step by step, with fission we move through the Periodic Table by great leaps, and this involved the release of a great amount of power. With fusion, we also move through the Periodic Table by leaps, but instead of going from heavier elements to lighter, we go from lighter elements to heavier. We put lighter elements together to create a new, heavier element, and this involves the release of much more power.

Fission and fusion—put that way—seem to be the inverse of each other: One is moving up, and one is moving down. But as we know from music, the inverse is never the simple inverse. There are always much different, or almost always, different implications in the inversion than meets the idea. This is the case with fusion. We have had control over fission for some time now. What's called the first "nuclear pile," was created in 1942 in Chicago as part of the Manhattan Project. We've had a fusion bomb, which is an uncontrolled form of fusion, since 1952. But we still don't have full control over causing fusion to happen.

So I'll say a few things about fusion: Fusion is not a terrestrial idea. Fusion, as far as we think, has been occurring inside of—and powering—stars for billions and billions of years, including our own Sun. This is why people may have heard the quest for fusion referred to as "bringing a star to Earth."

Most of the experimental work in fusion that's being



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done today, deals with plasmas. Plasmas are usually defined in a somewhat academic way, as a "charged ionized gas." So, a gas which has been heated or affected to the point that the electrons are stripped off the atoms, and you have a soup of electrons floating around with a soup of positively charged nuclei. There's a problem with this kind of thinking, which I'll get to in a moment.

Plasmas are very fascinating, very interesting manifestations of matter. Plasmas are also, just like fusion, not terrestrial: Plasmas occur in solar processes, and plasmas occur in galactic processes. Roughly 90-95 percent, maybe more, of the matter in the known Universe, is in the form of a plasma.

Human beings are babies in terms of our understanding of the behavior of plasmas, and this has been shown abundantly in fusion research, in the failure of plasmas to behave as we think they should. If you think like a reductionist, you will take the formulae for the interaction of charged particles and try to predict the behavior of a plasma, and every model that's been created using those methods, adding in another factor, another factor, another factor—every model has failed.

Plasmas have shown us that they have extremely unique properties, properties which are completely opposed to the formulae for an ideal gas system. They have exhibited the behaviors of self-organization, of concentration, rather than an homogeneous distribution.

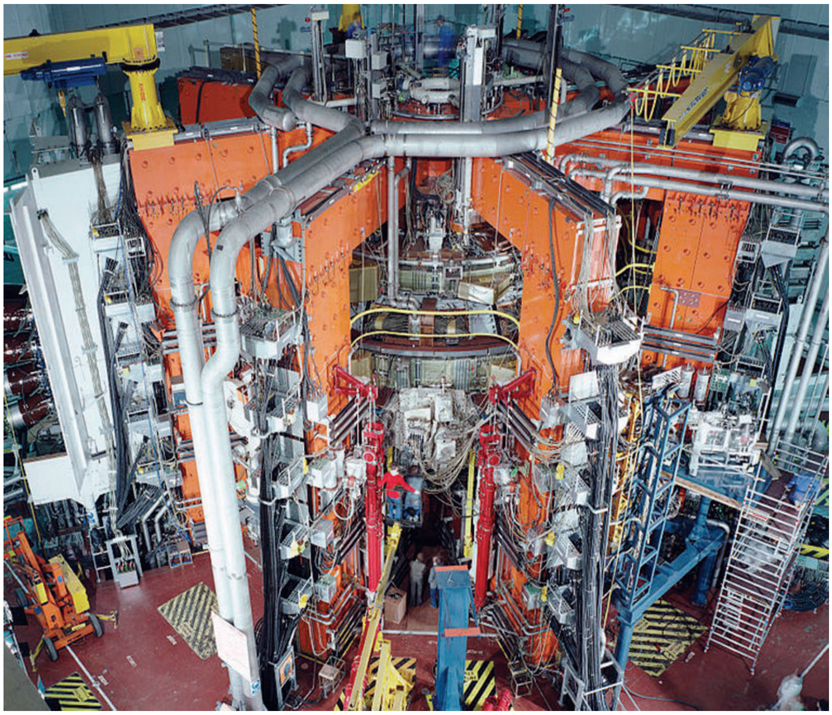
Another anomalous behavior of plasma is something which is actually used to great advantage in most fusion experiments today, which is something called "H-mode." H-mode refers to "high confinement mode." This is an example of a tokamak, a particular type of a fusion machine. Inside of a tokamak, while the gas inside is being heated as more and more thermal energy is being deposited inside the gas, the plasma begins to go through states of turbulence. Now, I don't know if anyone has experienced tuning a piano, or tuning two violin strings into unison, or any other harmonic interval: As you tune these strings, as the strings being to become closer and closer in tune, you begin to get a phenomenon called "acoustical beats" which are a certain turbulence in the harmonics. And as the strings come closer and closer into harmony, the rate of the acoustical beats speeds up, the turbulence speeds up, until the strings are perfectly in tune, and then you get a beautiful resonance. H-mode in a plasma is a somewhat similar phenomenon: As the thermal energy is deposited into the plasma, you get increasing resonance turbulence inside of the plasma until you reach a certain point, where suddenly—the turbulence stops. And the plasma is actually more stable, more easy to contain than it was before.

Now, nobody exactly knows why this happens, and when it was first discovered, I believe by Hans Bethe, this was a huge item of controversy.

I say these things to make the point that this state of matter which is associated with this newer advanced power of the nucleus, of fusion, is something which is defying all of our assumptions and challenging us at every turn, and this should point out to us that our assumptions about the nucleus are not right. There is something that we are missing, or more likely, there is something that we are blocking on, involved in this principle.

Just to reference another collaborator of ours, Dr. Robert Moon, who as a great friend of Lyndon LaRouche and helped to found the Fusion Energy Foundation—Robert Moon was part of the Manhattan Project and a student of William Draper Harkins. Dr. Moon insisted that the entire approach to the atomic nucleus was wrong, that the nucleus was not identical to the cartoons in your science text with a cluster of randomly situated protons and neutrons somehow held together by the "strong force." He said this is entirely wrong. Dr. Moon thought very much along the lines of Johannes Kepler, that the parts do not add up to the whole. He said that, just as Kepler proposed and proved that the planetary orbits are singularities within a harmonically and geometrically organized system, that the protons and neutrons within the nucleus are singularities within a geometrically and harmonically organized space which we call "the nucleus."

The Promise of Fusion



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The Joint European Torus magnetic fusion experiment in 1991.

Despite the challenges that we have run into in the attempt to control fusion, to create controlled fusion, and I will say that these efforts of fusion science have always been quite international, with robust international cooperation and progress; despite the challenges to our efforts, in the course of this research, human beings have done some incredible things: We have created densities of matter which are one hundred times the density of the Sun; we have created temperatures in the hundreds of millions to billions of degrees, hundreds of times hotter than the core of the Sun. These are temperatures which will vaporize any material.

We have also, therefore, built ways to contain these plasmas at these temperatures with magnets, and along the way, we have driven the development of super-conducting magnets.

We have created pulses of energy which are on the scale of quadrillionths of a second, which is faster than the rate at which chemical reactions occur.

We have driven forward precision machining, precision science and engineering to keep up with the requirements of this, and we have developed some of the most incredible lasers in the world, one of which I'll talk about in a moment.

So, take that short list and think back for a moment to how I opened this discussion on the characteristics of the human species, and consider that short list of things as an answer to the question of your biological textbooks of "what does the human species do?" Well, with fusion, this is what we do.

A "Tokamak" is derived from the Russian word for "torus," and it's the toroidal shaped fusion machine which contains the plasma at temperatures of hundreds of millions of degrees with a magnetic field. And here's a similar, beautiful picture of the superconducting tokamak in Korea, named the KSTAR.

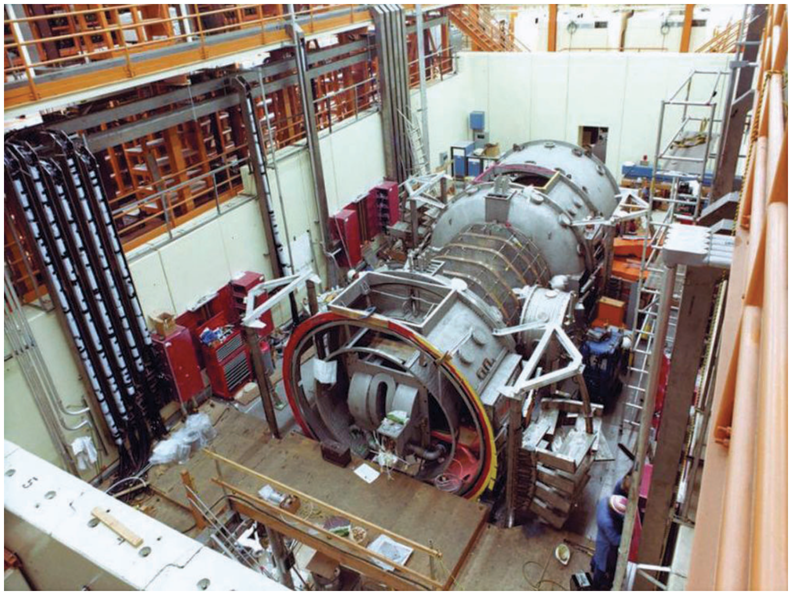
But the tokamak is not the only idea of how we will make fusion occur. This is a very incredible and beautiful fusion machine that was just completed and tested in Germany, called the Wendelstein 7-X, which is a type of fusion machine called a stellarator, where "stellar" comes from star. And this is actually a design of a machine that originated here in New Jersey at the Princeton Plasma Physics Lab. The PPPL has an incredible stellarator that they've designed, they've built, and it's sitting in parts in one of their rooms, because we don't have the money to put it together! I'll leave that there.

In the stellarator the copper parts are the magnetic coils, but these coils have a very, very complex twisted geometry. So the magnetic fields that these coils create is not a simple toroidal shape; it's a very complex twisted shape. That's another idea.

Another idea that we pioneered here in the United States in the 1980s, and could have been successful, except the funding was cut, is something called the "mirror machine." Instead of a closed torus, it's a linear geometry that has gigantic magnets at the ends to contain the fusion plasma.

We can not here discuss all the approaches to fusion, but I wanted to give you a little bit of a sense of an idea. There are also many interesting experiments going on with approaches to using the self-organizing characteristics of the plasma, like those filaments that I showed you, or those vortex rings. There are ideas of rather than trying to fight to contain the plasma, why don't we use the natural characteristics of the plasma itself to try to create fusion? I didn't show pictures of any of those experiments, but those are also going on and need to receive much more funding.

Let me discuss a few of the applications. Though we have not yet achieved fusion, we can already use some of what's been developed so far and foresee some of what we will be able to do with the full control over fusion power. I'm going to go through a few of them:



Flickr/Lawrence Livermore National Laboratory

Tandem Mirror Experiment (the TMX) at the Lawrence Livermore National Laboratory in 1979.

First is chemical processing. I don't know if anybody here is an expert in chemical production, but today the typical chemical factory uses a tremendous amount of heat to break down chemicals or create chemical reactions, uses working fluids to "leach" chemicals out of ores, dissolve an ore in this thing and leach what you want out of it; it uses electricity and so forth. With fusion reactors, it will be possible to divert some of that very high temperature plasma to a special section of the fusion reactor, where we can use it to process chemicals much more powerfully and efficiently than we do today. We could do things, for example, as take a fusion plasma into a special section, put some isotopes into it, and cause a tremendous amount of gamma radiation or ultraviolet radiation to be produced within the plasma, we could use that to do things like sanitize water on a mass scale, speed up the rate of chemical reactions, catalyze chemical reactions.

We could use the tremendous amount of cheap electricity created in fusion plants to make electrolysis a very cheap process. And these kinds of things could make possible the mass and very efficient production of heavy chemicals, methanol, ozone, and many others.

Another application of fusion is something called the "fusion torch," and this is something that was designed by two Americans named Bernard Eastlund and William Gough in the late 1960s who imagined, again, a special region of a fusion reactor where we divert the plasma into this special region, which is now at the temperature of tens of millions of degrees. Any material which is placed within that plasma is immediately vaporized, broken down into its constituent elements.

This completely revolutionizes the idea of "mining": Any material we take from a landfill, any random piece of rock, ore, that's dumped into the fusion torch, is immediately broken down into its constituent elements which can then be taken off into a separation process to create deposits of iron, deposits of carbon, of silicon, and so forth, which are mined from landfills, from plots of what were previously considered very poor ore and so forth. This will revolutionize our relationship to acquiring raw materials.

There is also something which I'm very excited about that was developed in the 1990s at the Lawrence Livermore Laboratory, which is working on creating fusion with lasers. This is the petawatt laser. The petawatt laser is a laser which can deliver a quadrillion watts of energy: for people who don't have a sense of scale of how much a quadrillion watts is, that's 1200 times the entire U.S. energy grid. So the petawatt laser can deliver a quadrillion watts in a pulse that lasts less than a trillionth of a second. That's faster than the rate at which chemical reactions occur, it's powerful enough to accelerate electrons to nearly the speed of light, meaning that they can transmute elements and change, in effect, the nuclei of elements; it also means they're accelerated so fast that they experience relativistic effects, such as their mass increasing.

The petawatt laser can also be used to machine, and I think this is incredibly beautiful. Laser machining is already orders of magnitude more precise than metal on metal machining; and now you look at the potentials of something like the petawatt laser and you imagine the kinds of precision we could get for the needs of space travel and so on.

The other thing that could be possible with the petawatt laser is surgery, because the petawatt laser can vaporize a single cell without disturbing any cells around it.

The Extra-Terrestrial Imperative

Another important application of fusion is space travel: moving mankind out into the Solar system. This is one design of a fusion rocket coming out of scientists, I think at the University of Washington in Seattle. Why is this important? Many, many people have recognized that it's ridiculous to say that we're going to put people on a rocket and spend nine months getting to Mars, let alone anywhere beyond it—completely impossible! With, first fission and then fusion rockets, it will be feasible to achieve what Mr. LaRouche called for back in the 1980s, which is a constant 1-gravity acceleration travel to Mars and into the Solar system.

So the design is that you have the very small fusion reactor at the business end of this rocket, and the products of it are accelerated out the back and that becomes the thrust of the rockets. This would make feasible the idea that we could travel to places like Mars with a constant 1-g acceleration. If you tried to do that with chemical rockets, Jason, I think, calculated that you would have to carry chemical propellant equal to the weight of Saturn. [laughter]

This promises to open up the development of the Moon, Mars, the moons of Jupiter, the moons of Saturn. The idea of time was completely changed by the building of the railroads, where it used to take 3-4 days, two weeks, six weeks to get from New York City to certain places in the country. Suddenly, with the building of the railroads, you could do that in *one day*. It's very similar with the idea of nuclear rockets. Things that are completely out of our reach, six or nine months away, a trip that would severely damage the human body; suddenly time is compressed and they're put in the realm of weeks.

I'll just end with an important application of fusion which is—electricity. I referenced the needs of the developing world in the last century, when fission power first became available. Consider the needs of the world today, consider the industrial needs, consider the level of electricity consumption if we bring seven or ten or twenty billion people up to a modern standard of living, and the full industrialized economy with fusion power plants which that implies.

This is important for Earth, it's important for space as well.

Let me say something about space. It was recognized by Krafft Ehricke and many others, that civilization on the Moon or anywhere else out in the Solar system could only be powered by nuclear power. So the idea of continuing the development of life off of the Earth, and beginning to colonize these other places in the Solar system, is only achievable with the kinds of energy densities and consistency that you can get from nuclear power.

But also on Earth! I will end with two quotes from two leaders in both fission and fusion research in the 1950s. The first is the head of the Indian Atomic Energy Commission Homi J. Bhabha, who chaired the first ever international conference on fusion, in Geneva, Switzerland, in 1955. And he said:

"I venture to predict that a method will be found for liberating fusion energy in a controlled manner within the next two decades. When that happens, the energy problems of the world will have been solved forever, for the fuel will be as plentiful as the heavy hydrogen in the oceans."

And then by Lewis Strauss, who was the head of the U.S. Atomic Energy Commission. This was from 1954:

"Our children will enjoy in their homes electrical energy too cheap to meter.... It is not too much to expect that our children will know of great periodic regional famines in the world only as matters of history, will travel effortlessly over the seas and under them, and through the air with a minimum of danger and at great speeds, and will experience a lifespan far longer than ours, as disease yields and man comes to understand what causes him to age."

That's the potential! I think it is beautiful that, in the 1950s, somebody felt this great sense of the transformation of mankind, that this was not just some new energy source to stick in your backyard or something, but this really was a complete transformation of the entire species, that there was something of great importance going on.

This presentation was by no means comprehensive, but hopefully it has given you a hint as to why Mr. LaRouche has called for a fusion-driver crash program. We are in the position to completely upshift the human species into a new era, *but it is something that has to be willed*. It does not happen automatically; this is something that has to happen as an intended effect of our economic and science and cultural activity.

Mathematics: The Method Of Madness

by William Ferguson

"The point is, we're living in a society where most people have beliefs, and the beliefs are based on certain conditioning, but they always really are thinking, either in the fantasy of the future, or try to rely upon the past as the substitute for future, for understanding the future. And the problem is, how do you get people to get free of that?

... I've taken a tougher position on this thing, because I realize that most of our citizens, who think they have knowledge, don't, because of the idea of being practical; or the idea of being deductive. And all humanity, and the very characteristic of humanity, good humanity, is to see a future, which mankind had never experienced before. That's the characteristic of mankind... Animals cannot do that. They cannot see that. Only human beings have the power to see the future... And unfortunately, only the few human beings, who understand what the meaning of the future is.

And therefore, today, I find most of what I have to do, is I have to correct the mistakes of popular opinion, correct the error in which people put confidence in popular opinion...

We don't have science any more; we have mathematics. Mathematics is the substitute, officially since the Twentieth Century, as a replacement, for science. In other words, mathematics and the methods of mathematics, are treated as a mere substitute, for what is actually science, and that means the very idea of understanding the future. But remember, mankind is the only species which is truly, intrinsically creative by its nature. No form of mere animal life, is capable of understanding the future. And most people, today, act like animals do, when they call that 'being practical.' So that's what we've got to overcome."

—Lyndon LaRouche,
Fireside Chat, July 23, 2015

In the above statement, Lyndon LaRouche addresses the fundamental errors in thinking that must be overcome if mankind is to reject its current course toward thermonuclear annihilation, and instead choose survival, a human future, the course toward a thermonuclear fusion-based economy, through the implementation of his Four Cardinal Laws.

"Practical" people believe that "experience" has taught them the way things work, or appear to work. They say "Everybody knows that...," or "My mother always told me that...," or "I read in the *New York Times* that...". Practicality lies in the neighborhood of sense perception and fear of the unknown: on the corner of "I'll believe it when I see it," and "I need to go along to get along."

Consider why, during his eight years in office, not one Congressman introduced legislation to impeach Barack Obama, the worst President in American history and one whose treasonous crimes were a matter of public record. It wasn't "practical"; such an action would not have the (mathematical) support of other members of Congress; it was not worth the risk of losing a few campaign dollars, losing an election, or losing even one's life, even if the failure to take such action placed the world on a future path toward nuclear annihilation. And what of individual citizens? Why have your friends, neighbors, or even you yourself, tolerated the evil of the trans-Atlantic Wall Street-London system for so many years, and done so little to act on behalf of a better future?

The universal genius Gottfried Leibniz, whose *Monadology* LaRouche has described as "perhaps the most essential document in all of physics," states the problem of practicality precisely:

"There is interconnection among the perceptions of animals which bears some resemblance to reason; but this interconnection is only founded in the memory of facts or effects, and not at all in the knowledge of causes. That is why a dog runs away from the stick with which he was beaten, because his memory represents to him the pain which the stick caused him. And men, to the extent that they are empirical, that is, in three fourths of their actions, act only like beasts. For example, we expect the day to dawn tomorrow because we have always experienced it thus; only an astronomer foresees it by reason, and even this prediction will fi-

nally fail, when the cause of day dawning, which is not eternal, shall cease."

Most people in today's degenerate culture have no education in the method of thinking, through which we transcend "the memory of facts or effects" to achieve "the knowledge of causes," and therefore, like the poor dog Leibniz describes, are intimidated by the stick of popular opinion, wielded by institutions under Wall Street's influence, for example. They run away from the challenge of political responsibility and leadership, to affiliate, commiserate, escape with others who have withdrawn into whatever distractions will serve, into a mutual comfort zone, to experience something akin to the feeling of cozy familiar warmth, sounds, and smells of cubs snuggled together in the den, chicks in the nest, or cattle herded on the way to the slaughterhouse. That is why your fellow citizens did not shut down Wall Street or throw Obama out of office yesterday. But as for tomorrow...

Human beings can, and if they are to survive, must choose to break out of the virtual reality of sense perception, to live in the actual world of ideas, of discovery of the unseen principle that governs the development of the universe, and live in service to a higher ideal, on behalf of a vision of the future.

Practicality ultimately is a rejection of the principle, that Man has this potential, and is a species apart from and above the beasts.

Axiomatic Revolutionary Advances

In several writings, Lyndon LaRouche has described the pedagogical exercise of an economy where robots carry out all productive functions: mining, extraction and processing of raw materials, manufacturing, construction, and transportation of machinery, including of the robots themselves, the "economic" activity one may observe through "sense perception," all directed by an "artificial intelligence." This robot economy must operate at a fixed level of technology, because even though they might be able to reprogram themselves to make minor improvements in efficiency, the machines are incapable of generating those technological advances which can only result from scientific breakthroughs by the human mind. The finite raw materials resource base defined by that fixed technology level must eventually be depleted, to the point that the economy breaks down. Of course, this is also the fate of any so-called human economy which adopts a "Green" policy. Without increasing the energy-flux density of applied power in an economy, which is the direct result of technological application of a scientific revolution, an overturning of the axioms of "proven" knowledge, and creation of new, more powerful conceptions of physical principle, mankind degenerates, and perishes.

In reality, mankind has progressed from an economy powered by animal labor, to wind power and wood-burning, to fossil fuel power, and to nuclear fission, and from a world population of a few million to over seven billion.

In "On LaRouche's Discovery," LaRouche writes:

"The central feature of my original contribution to the Leibniz science of physical economy, is the provision of a method for addressing the causal relationship between, on the one side, individuals' contributions to axiomatically revolutionary advances in scientific and analogous forms of knowledge, and, on the other side, consequent increases in the potential population density of corresponding societies. In its application to political economy, my method focuses analysis upon the central role of the following, three-step sequence: first, axiomatically revolutionary forms of scientific and analogous discovery; second, consequent advances in machine tool and analogous principles; finally, consequent advances in the productive powers of labor."

He describes these discoveries as an outcome of his 1948-1952 refutation of the application of statistical methods to living and cognitive processes by MIT mathematician Norbert Wiener.

Mathematics Meant to Murder the Mind

Mathematics is not science and, especially since the 1900 International Congress of Mathematicians in Paris, it has been deployed to destroy the very *idea* of science. At this conference, the German mathematician David Hilbert presented a program for the axiomatization of mathematics and physical science in the Twentieth Century, to reduce all science to a system of propositions logically derived from a finite set of facts assumed to be self-evident from experience, based on the model of Euclid's *Elements*. Hilbert took it a step further, in that his requirements for a mathematical system used only logical consistency, not physical reality or making any kind of real sense at all, as the standard. This is a form of oligarchical control, the *opposite of science, a conspiracy to assassinate the human mind*.

Earlier, in 1895, the evil British mathematician Bertrand Russell attacked the revolutionary Bernhard Riemann's habilitation dissertation, *On the Hypotheses Which Lie at the Foundations of Geometry,* to attempt to outlaw any truly anti-Euclidean geometry in physics. Within ten years, with the discovery of the quantum of least action and relativity, Max Planck and Albert Einstein continued Riemann's revolution by overturning axioms about energy, matter, space, and time, and proved that Russell was a malicious idiot.[1]

Following Hilbert's program, in his *Principia Mathematica* (which he named in honor of Isaac Newton's famous fraud), Russell attempted to axiomatize arithmetic, to reduce it to mere logic. (After almost four hundred pages of "reasoning," he triumphantly declared it proven, that "1+1=2"). After Einstein's future friend and collaborator Kurt Gödel used mathematical logic to conclusively prove again that Hilbert and Russell were fools, Russell abandoned his mathematical efforts, and pursued other means of menticide and genocide.

Wikimedia Commons

Lord Bertrand Russell

Planck and Einstein, the last of the actual scientists, spent the latter decades of their lives in courageous epistemological warfare with *Wunderkinder* who arrogantly asserted that they had mathematically proven that there is no causality in the Universe. After the passing of these two giants, the mathematical monstrosities became hegemonic, and the consequent scientific and cultural decay have brought the human species to the edge of self-destruction.

Of course, mathematics, like a computer, can be a useful tool, and learning to use it can serve many noble purposes, including science. But if instead you are taught to think like a computer, your mind is being destroyed. The model of education since 1900 is to take a student eager to study science, and to so indoctrinate him in axiomatic-deductive mathematics, that he has mastered mathematical techniques at the expense of his creative potential for actual scientific discovery, or is forced to quit the course in frustration.[2]

Euclid's Elements: Believe in Your Rulers, Not in Your Mind

Is the government of a nation a system of enforcement of rules imposed upon a group of individuals to keep them under control as they pursue their narrowly perceived self-interest?

Is the purpose of education to train young people in skills and knowledge so that they will be "employable" as adults and obedient (or otherwise controllable) under the government?

Is science a system of rules and formulas that describe how the world appears to work, a "true opinion" accounting for the phenomena of sense-perception?

For an oligarchical elite, Euclid's *Elements* has served as a model useful tool for these purposes.

If you examine Book I, it consists of 23 definitions of geometrical objects, 5 postulates regarding how to draw objects and on the relationships between them, 5 common notions about magnitudes, and 48 propositions which can be logically derived from all of these.

It all leads up to, and concludes with, what we know as the *Pythagorean theorem* and its converse. Each "element" appears to be true, i.e. truly consistent with what we see and can draw with a compass and straight-edge on a flat surface.

This is the kind of education which Lyndon LaRouche flatly rejected "axiomatically" in junior high school.

What's the problem, you might ask, as long as all the propositions are true? It works, doesn't it?

In truth, at least some, if not all, of Euclid's propositions were not originally discovered by this method, certainly not the Pythagorean theorem.

This system presents the illusion of a clean, sanitized universe of fixed relations, and serves as the model for thousands of years of textbooks designed to smooth over the actual processes of discovery. You get the "facts"; a neatly arranged, lifeless corpse, but not the spirit or the substance of actual science.

1. See http://action.larouchepac.com/riemann_vs_russell

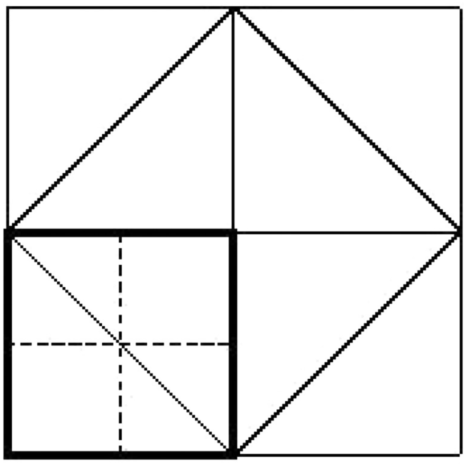
2. This is seen today in the phenomenon of large numbers of college-age science students who are channeled into "Computer Science," where they are drilled in the use of "mathematical algorithms," which supposedly mimic and predict all aspects of human activity and thought.

As LaRouche described in the passage above, the substance of science, the subject of technology, is "axiomatic revolutionary advance." A human being uses his mind to discover a truth about the universe, which, when communicated and applied to human activity, increases the species' power to act on the universe, measured in terms of increase in potential population density, and increases the power of individuals to achieve, transmit, and assimilate future discoveries.

The point should not be for the student to "learn" the "fact" of the Pythagorean theorem, but to rediscover it for himself, to replicate the process of discovery in his own mind, and thereby develop the capabilities for a life of sequential rediscoveries, ideally going to the highest level, to that of an original discovery of knowledge new to the human race; an "axiomatically revolutionary advance."

Knowing That You Don't Know

Instead of Euclid's *Elements*, the model of education should be, and has historically been, the Socratic dialogues of Plato, where Socrates provokes his interlocutors to question, and overthrow their own assumptions, in the process of constructing a new, higher hypothesis.



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The solution to the slave boy's problem in Plato's Meno *dialogue.*

In the *Meno* dialogue, Socrates guides an uneducated slaveboy to discover geometric truths from within himself. He draws a 2-foot by 2-foot square, and asks him if he can name the side of a square with an area twice as large, i.e., 8 square feet. The boy confidently and triumphantly states that to double the size of the square, the sides should be doubled, and gives the answer: 4 feet. Socrates draws the 4 by 4 square, and the boy recognizes it is four times as big as the original. The boy is somewhat deflated, but continues on. He tries again, and since four feet was too big, he proposes a 3 by 3 square, and then accepts that this too is wrong.

As Socrates points out to Meno, the boy has gone from a confidence while in error (he does not know, but does not *know* that he does not know), to a state of perplexity and wonder (he does not know, and he *knows* that he does not know), and is therefore in the perfect condition to discover the solution, because he has become eager to know it. And he indeed does finally recognize the necessary construction.

This is the substance of an educational method for creating geniuses; individuals who will generate the revolutionary discoveries upon which human survival and progress depend.

Metaphor, not Mathematics

Mathematics is the grinding out of the consequences of what you assume that you already know. It is a codification of the practical. Everything valid that can be developed as true in mathematics, is a discovery of the *past*.

Socrates and Plato, Nicholas of Cusa, Johannes Kepler, and Leibniz, Bernhard Riemann, and Lyndon LaRouche have demonstrated that the substance of scientific discovery lies in the classical artistic principle of metaphor. Through the ironical juxtaposition of valid, yet apparently contradictory ideas, the mind can be moved to a higher, less imperfect idea.

The subject of actual science, and of classical artistic composition, is the refutation of the practical. It is the development of the power of the human mind to generate the discovery of what is unknown: the *future*.

Until Kepler's "creative interruption,"[3] the business of astronomy was the mathematically accurate description and prediction of visual sense impressions of the motion of the planets in the sky, with no concern as to cause. As a student of the "divine Cusa," Kepler adopted the mission to glorify the Creator by revealing "the nature of the Universe, God's motive and plan for creating it," and created a *New Astronomy* (1609).

Kepler provokes his readers' powers of reason to join his quest for truth, by demonstrating that the three predominant models of the universe of that time, Ptolemy's 1,400-year-old geocentric system of circles upon circles, the new Copernican heliocentric system, and Tycho Brahe's hybrid system, although they are based on contradictory assumptions, could all be configured to yield the same results. Mathematically, practically, they all appeared to work. Therefore the truth must lie outside of the appearances that these models were designed to account for. Some standard other than matching the data of sense-perception must

3. See *Cusa's Method of Creative Interruption* by William F. Wertz, Jr.

lie at the foundation of actual knowledge.

Kepler then proceeds to construct his "vicarious hypothesis," a descriptive, predictive model more accurate than all the other three, based on the observed longitudinal motion (around the equator of the sphere of the fixed stars, as defined by the apparent motion of the Sun on that celestial sphere, called the ecliptic), and based on the accepted assumption of circular orbits of uniform motion about a mathematically important, completely fictional point, an equant.

This vastly superior model implies a certain distance between the center of the Mars orbit and the Sun. He then uses observations of the latitudes of Mars (motion above or below the ecliptic), which give a different result for the distance. Identifying this contradiction, Kepler proceeds to adjust the vicarious hypothesis, assuming the observationally true distance derived from latitudes. But this then throws off the highly accurate longitudes. No matter what adjustments he attempts to reconcile the two, there is always a discrepancy. At the point in the orbit of maximum difference, the longitude is off by 8 minutes of arc, 8/60 of one degree; tiny, but not to be ignored by the honest investigator, armed with Tycho Brahe's measurements, accurate to one or two minutes.

Indeed, this irreconcilable paradox was a goal of Kepler's intention all along! With this he proved that, after 1,400 years, the assumption of uniform circular planetary orbits must be forever discarded, and that, if astronomy is to be grounded upon truth, it must seek to discover physical principle, not mere description of appearances: *"Henceforth I shall lead the way toward that goal according to my own ideas. For, if I had believed that we could ignore these eight minutes, I would have patched up my hypothesis accordingly. But since it was not permissible to ignore them, those eight minutes point the road to a complete reformation of astronomy…"*

He had been convinced, since the time of his earlier work, *The Secret of the Universe*, that the cause of the motion of the planets centers upon the Sun. But he knew that, like Socrates, he had to cast his readers into perplexity, in order to enlist recruits to join his "War with Mars" and his mission to discover the principle of universal gravitation.

Kepler proceeds in the mission to discover the principle governing the universe, or as Leibniz would say, the "necessary and sufficient reason" that the universe is organized in the way that it is, and not in some contrary way. In his *Harmony of the World*, he develops this reason as a principle of musical harmony.

Isaac Newton Doesn't Give a Fig

The oligarchical forces who rule this dying empire do not want revolutionary thinkers running around loose, so they create and promote myths to prevent the emergence of actual scientists, and suppress actual discoveries and discoverers. One of these myths is that Isaac Newton discovered the principle of gravitation, not Kepler.

You should find it astonishing that English translations of Kepler's books were not generally available until the late Twentieth Century (and, if one searches online: Kepler's *New Astronomy*, $200 and up, few copies available; Newton's *Principia Mathematica*, under $20.00).

Newton's *Principia* is the book in which Newton derives the "law of gravity" from "Kepler's Three Laws" (so the myth goes). It begins with his outline of axioms, laws of motion, his assumptions of absolute uniform space, and absolute time flowing uniformly. It is clear that he intends, contrary to Kepler, to build a universe from the "ground up." He is informing you of the properties of an empty box, and that he intends to fill it.

Later he states this "principle," *Hypotheses non fingo*: *"That which does not follow from the phenomena, should be called a hypothesis, and hypotheses … whether metaphysical, physical, whether they involve hidden properties or are mechanical, have no place in experimental physics. In this physics, propositions are derived from the phenomena and generalized by induction."* As if all those assumptions about absolute space and time, were not hypotheses.

He is saying that his intention is to provide a mathematically precise description of what appears to happen as presented by the senses, without regard to an idea of a reason for it. Practical.

What is the difference between this conception of science, and Ptolemy's epicycles? Instead of circles upon circles, we have forces acting over a distance instantaneously with nothing in between, which even Newton admitted is absurd, in a letter written five years later. But *it can be made to appear to work*.

In reality, he has learned nothing from Kepler. And he wants to make sure that you will not either.

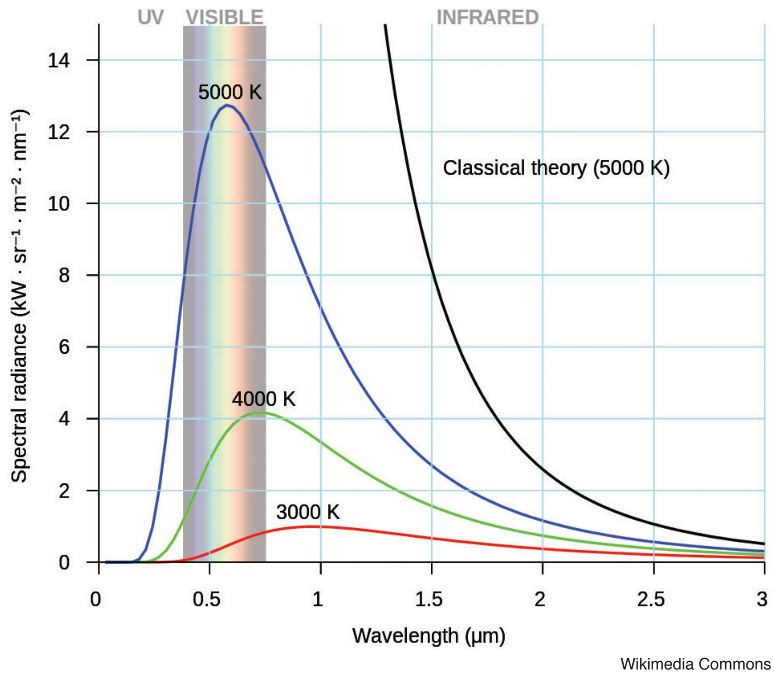
Planck and Einstein, the Last Scientists

As a young university student in 1874, Max Planck had been advised by his physics professor not to enter the field, because there was hardly anything left to be discovered.

Despite this advice from a victim of the cult of practicality, Planck, who might also have prospered as a professional classical pianist, chose a career in physics: *"My original decision to devote myself to science was a direct result of the discovery which has never ceased to fill me with enthusiasm since my early youth—the comprehension of the far from obvious fact that the laws of human reasoning coincide with the laws governing the sequences of the impressions we receive from the world about us; that therefore pure reasoning can enable man to gain an insight into the mechanisms of the latter."*

In the late 1890s his attention turned to the "blackbody problem": how does the proportion of radiation of different frequencies emitted from a heated object change as a function of its temperature? All predictive models based on accepted contemporary physics had failed to match the experimental results.

Planck wrote in his *Scientific Autobiography*, "... this so-called Normal Spectral Energy Distribution represents something absolute, and since I had regarded the search for the absolute as the loftiest goal of all scientific activity, I eagerly set to work."



The Black Body Problem

In 1900 Planck was able to construct an accurate mathematical formula for the spectrum of blackbody radiation, which was empirically valid but had no physical meaning in terms of the existing concepts of physics. In seeking such, he had to discard the assumption of continuous radiation and introduce a revolutionary new idea: that radiant energy can only be emitted or absorbed in whole number multiples of an elementary physical unit, the quantum of least action ($E=nhv$, where v is the frequency of the radiation, and h is Planck's constant). Despite its great success in explaining and predicting experimental results, Planck was slow to accept the significance of his discovery, and spent years of great effort attempting to fit the quantum into the framework of classical physics.

In 1905, the young patent clerk and violinist Albert Einstein, by asserting that the laws of physics should be universal, and that the speed of light is universally constant, overturned thousands of years of common sense, and demonstrated that matter is a concentrated form of energy: $E=mc^2$.

In that same year, Einstein applied Planck's quantum concept to the photoelectric effect, the phenomenon of the emission of electrons by a metal plate caused by light shining on it. Einstein proposed that the light quanta, later known as photons, would cause electrons to be emitted only if they were above a certain threshold frequency. For example, a dim blue light would cause the metal to emit electrons, while an intense red light would not, because the blue light quanta have a higher frequency and are each more energetic than the red, even though there would be more red light quanta. Einstein, who was much less reluctant to accept the idea that the quantum was an actual physical entity instead of a provisional assumption, was proven correct by numerous experimental results in the following years. For their work in developing the quantum hypothesis, Planck and Einstein were awarded the Nobel Prize in 1918 and 1921 respectively.

But their revolution was hijacked, by perpetrators and victims of the Hilbert-Russell program to destroy science.

Don't Know. Don't Care. Shut Up and Calculate!

The experimental results in microphysics in the Twentieth Century generated paradoxes, such as the wave-particle duality. In some experiments light behaves like a particle, in others like a wave, but not both simultaneously. The same is true of subatomic particles. The Uncertainty Principle states that the position and momentum of a particle cannot both be known simultaneously to an arbitrarily fine degree, i.e. the more you know about the position, the less you can know about the momentum.

But instead of scientists working in the tradition of Planck and Einstein, taking up the epistemological challenge to discover a higher principle which resolves the paradoxes, we have the "Copenhagen Interpretation" of quantum theory, imposed upon physics by Niels Bohr and his co-conspirators, to forbid you from asking the questions. When you conduct the double slit experiment, light behaves like a wave; when you shine it on a metal plate, it behaves like a particle—and in between, when you are not observing, what it does is *none of your damned business*. A vast machinery of mathematics has been constructed to calculate probabilities of destinations and trajectories, but you are not allowed to conceive what is actually going on. There is no causality, there is no *necessary and sufficient reason*. The physics *is* the mathematics. *Hypotheses non fingo*.

"I like to think that the moon is there even if I am not looking at it."

—Albert Einstein,
on the Copenhagen Interpretation

"I think it is safe to say that no one understands quantum mechanics. Do not keep saying to yourself, if you can possibly avoid it, 'But how can it possibly be like that?', because you will go down the drain into a blind alley from which nobody has yet escaped. Nobody knows how it can be like that."

—Richard Feynman,
in *The Character of Physical Law* (1965)

"Some years ago, Freeman Dyson, reasoning on the process of learning and teaching quantum theory, came out with the idea that a physics student, after learning the tricks of the quantum formalism, and getting right answers, 'begins to worry, because he does not understand what he is doing.' The student, says Dyson, 'has no clear physical picture in his head, and tries to arrive at a physical explanation for each of the mathematical tricks. He gets discouraged and after some months of unpleasant and strenuous time, he suddenly says: ***I understand now, that there isn't anything to understand.****'"*

—Pedro Pereyra,
in *Fundamentals of Quantum Physics: Textbook for Students of Science and Engineering*

The mathematical models of modern quantum physics are highly accurate, and have had many useful and important technological applications. But the mathematical savants themselves admit that they do not understand what is going on— and they are "just fine with that." Or, one could say, they don't mind it. Why is this accepted as "science"? *Because it appears to work*, just like the epicycles of Ptolemy, or "Newton's Laws of motion." And if you will accept this as a scientific method, or stay away from science because "the math is too hard," you will not be a threat to the imperial system.

Paul Samuelson Takes Credit for Economic Disintegration

"I don't care who writes a nation's laws, or crafts its advanced treaties, if I can write its economics textbooks."

"To a person of analytical ability, perceptive enough to realize that mathematical equipment was a powerful sword in economics, the world of economics was his or her oyster in 1935. The terrain was strewn with beautiful theorems begging to be picked up and arranged in unified order."

—Paul Samuelson

It might be accurate to assert that the Nobel Laureate mathematical economist Paul Samuelson, did not consider you a computer, but rather, an animal, or a particle. Which axioms lie at the foundations of his theorem lattice? In the first chapter of his textbook, *Economics* (four and a half million copies sold, nineteen editions since 1948), he quotes and lauds Adam Smith as "the founder of modern economics," as if Gottfried Leibniz had never existed.

In his *Theory of Moral Sentiments*, Smith gives us the very definition of the practical man:

"The administration of the great system of the universe... the care of the universal happiness of all rational and sensible beings, is the business of God and not of man. To man is allotted a much humbler department, but one much more suitable to the weakness of his powers, and to the narrowness of his comprehension: the care of his own happiness, of that of his family, his friends, his country... But though we are... endowed with a very strong desire of those ends, it has been entrusted to the slow and uncertain determinations of our reason to find out the proper means of bringing them

about. Nature has directed us to the greater part of these by original and immediate instincts. Hunger, thirst, the passion which unites the two sexes, the love of pleasure, and the dread of pain, prompt us to apply those means for their own sakes, and without any consideration of their tendency to those beneficent ends which the great Director of nature intended to produce by them."

For Samuelson, economics is not the Hamiltonian-Leibnizian American System of Political Economy dedicated to the promotion of the General Welfare, but the application of the mathematical methods of classical thermodynamics to "the study of how societies use scarce resources to produce valuable commodities and distribute them to different people." In fact, it is clear that Samuelson hates even the memory of the founder of the science of physical economy. He writes "If Newton had not invented the calculus when he did, Leibniz or someone named Smith would have."

Samuelson is the perfect academic tool of Wall Street to inflict destruction upon the economy and on the cognitive powers of his readers. According to Samuelson's calculus, if you lose your job, cannot afford a life-saving operation, or are starving to death, "Sorry, Buddy, it's nothing personal, that's just how the numbers crunched out." There is however, one difference between Samuelson's mathematical economic frauds, and those of Euclid, Ptolemy, Hilbert and Bohr: unless the total disintegration of the financial system was the intended goal, *it does* not *appear to have worked*. Not that it didn't make him a filthy rich hedge-fund operator. You could even say he made a killing.

One of Samuelson's most famous students, and hedge-fund partners, is Robert C. Merton, who co-developed the Black-Scholes-Merton mathematical model of financial derivatives markets. Using this model, his hedge-fund, Long Term Capital Management, made tremendous profits in its first three years of operation. In 1997 he was awarded the Nobel Prize in Economics for his invention. In the summer of 1998, LCTM lost $4.6 billion, and the Federal Reserve had to organize an emergency bailout of $3.5 billion for the fund from fourteen financial institutions, in order to avoid a global financial blowout.

Innovation & Business Architectures, Inc.

Paul Samuelson

Perhaps in an attempt to convince you that he is really a good guy after all, or perhaps admitting that he sold his soul way below market value, in the "Valediction" of his tome, Samuelson quotes another of his heroes, "this century's greatest economist," John Maynard Keynes (B.A. Mathematics, Cambridge):

"Suppose that a hundred years hence, we are eight times better off than today (1930). Assuming no important wars [!] *and no important increase in population* [!!]*, the economic problem may be solved. . . I see us free, therefore, to return to some of the most sure and certain principles of religion and traditional virtue ...—that avarice is a vice, that the exaction of usury is a misdemeanor, and the love of money is detestable... We shall once more value ends above means and prefer the good to the useful.*

"But beware! The time for all this is not yet. For at least another hundred years we must pretend to ourselves and to every one that fair is foul and foul is fair; for foul is useful and fair is not. Avarice and usury and precaution must be our gods for a little longer still. For only they can lead us out of the tunnel of economic necessity into daylight."

We now face a trans-Atlantic financial and economic disintegration caused by generations of citizens and policy makers brainwashed by the likes of Paul Samuelson. We have a population allowing its most productive agricultural state to die of thirst, next to the largest ocean in the world. We have supposedly educated people who are sincerely concerned about how to make a turkey sandwich with a minimum carbon footprint. Decades after the discovery of nuclear fusion, we have no fusion power plants, only thousands of warheads capable of annihilating the human species.

With the education programs and cultural collapse of the recent decades, we are probably doing much worse than the aforementioned robots.

The Courage to Change Axioms

In 1995, in a ceremony at the White House marking the success of Israeli-Palestinian peace negotiations, Israeli Prime Minister Yitzhak Rabin said, "If I raise my toast, I will raise it to those who have the courage to change axioms."

The next necessary step in the progress of mankind, the quantum leap into a fully thermonuclear-powered economy, will require the defeat of the anti-scientific method of mathematical formalism, and a renaissance of the Socratic method in scientific research and physical economy. It will also require the overthrow of the rotten Wall Street/City of London system that has brought us to this point of economic collapse and possible species extinction. How can we rapidly create a citizenry which is equal to this challenge?

Public Domain

Portrait of Schiller by Gerhard von Kügelgen

In *On the Aesthetical Education of Man*, Friedrich Schiller conducts a Socratic dialogue with a Danish prince, on the subject of "the most perfect of all works of art... the construction of a true political freedom."

He identifies the contradiction between the necessity of Man's absolute freedom, to maintain his humanity, and the necessity of government, to maintain his physical existence. A society must have a means to elevate its citizens to be capable of self-government. Schiller writes:

> *"All improvement in the political must proceed from the ennoblement of the character...—but how can the character ennoble itself under the influence of a barbaric state constitution? One had thus to search for an instrument to achieve this end, which the state does not provide, to open up springs thereto, which preserve themselves pure and clear in the midst of every political corruption... This instrument is beautiful art, these springs open up in its immortal models."*

Helga Zepp LaRouche describes his ideal: "Schiller's special contribution consists precisely in his development not only of Reason, *per se*, but also of a *method* whereby man is able to ennoble his emotions. He views it as nothing less than the world-historical goal of human development, 'to establish an inner agreement between his two natures (the sensual and the cognitive), to always be a harmonious unity, and, with his full-voiced humanity, to act.' And thus, for Schiller, the Beautiful Soul is the pinnacle and highest aim of human development. A Beautiful Soul is a person for whom Freedom and Necessity, duty and passion merge into a unity, such that a person so educated, can always blindly trust his own emotions, because those emotions would never urge upon him anything other than what his Reason dictates."[4] The LaRouche Manhattan Project is employing this classical artistic method of Socratic Dialogue and classical music to build a movement capable of accepting and fulfilling the mission of human development. You are welcome to join it.

The Composition of the Universe

Look around you, wherever you are reading this. Every "object" that you can see, hear, touch, smell or taste, be it an ink pen, a chair, a computer, an apple, or even the dog pestering you to take it out for a walk, is a product, an embodiment of the continuing process of human scientific discovery applied to human activity, for, hopefully, a beneficent human purpose. Before these objects existed in the realm of the senses, they only existed in a human mind, as an image from the future, which that mind acted to create.

You, too, are a product of the historical process of human development. If you have read this far, you possess the cognitive capacity to imagine a kind of future worthy of the human race—to make the creative decision to accept the mission to bring it into being, and to act Socratically to move your fellow citizens to strive so in concert with you. The alternative may be human extinction.

4. See "European Culture As a Factor Of Intercivilizational Dialogue," *EIR*, Volume 30, Number 36, September 19, 2003.

MATHEMATICS & MEASUREMENT

Science vs. Ideology

by Lyndon H. LaRouche, Jr.

July 28, 1998

A literate secondary-school graduate, as defined by Alexander Dallas Bache's standards for education,[1] would have had the skills required to show, that, since 1971, the U.S.A.'s per-capita physical output and (physical) standard of living, per-capita, have been in an accelerating spiral of general, physical-economic contraction.[2] **EIR** has repeatedly documented the facts which prove that this contraction has occurred; the proofs are elementary in form, and the facts are conclusive. Nonetheless, around the world, up to the moment this is being written, most among today's governments appear either to believe, or to pretend to believe, that a U.S. economy which has been shrinking without interruption for more than a quarter-century, has been growing!

The question is: How did it happen, that, in the U.S.A., in particular, so many among government officials, and others, have been misled into supporting those policies which have ruined the U.S. economy during the course of the recent quarter-century? Was their self-delusion the result of wishful thinking? In part, the answer is, "Yes." However, stock brokers' and others' wishful fantasies put to one side, the methods of calculation used to support those ruinous policies, for both general forecasting and national-income accounting, have been consistently absurd. How could a once-literate U.S. population have miscalculated so badly?

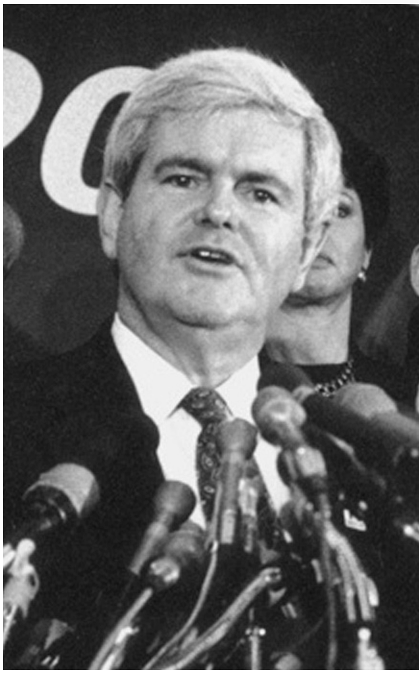
"Calculation" is the word we emphasize in this report. The essence of the problem, as we shall show here, is that our government and Wall Street, to name but two relevant cases, have chosen a kind of mathematics which is intrinsically absurd when applied to economic analysis. What may appear to work quite neatly for ordinary mechanical engineering, for example, is incompetent for addressing economic processes, or other subjects in which the principles of life as such, or of human cognitive behavior, are the determining, or, in Leibniz's usage, *characteristic* form of action through which the ultimate outcome of the process is shaped.

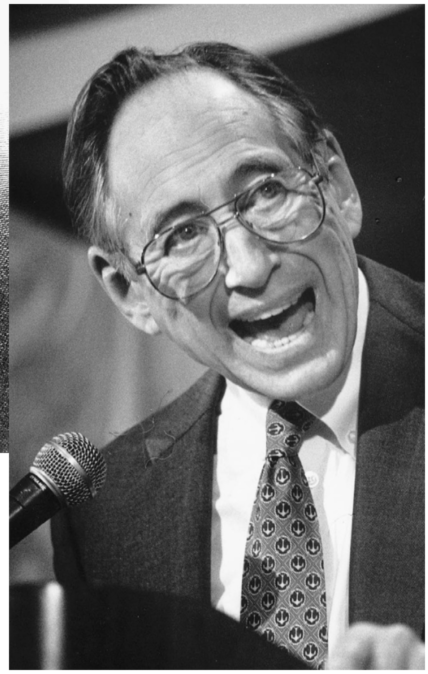
Even if most of today's policy-shapers lacked knowledge of the relevant issues of mathematics, there was no excuse, even by relatively unsophisticated standards of reasoning, for the blundering miscalculations by means of which the present crisis was generated. By any reasonable physical standard, engineering or other, the figures of those policy-shapers simply do not add up.

For example, today, we have the typical fanatics encountered among the monetarists of Wall Street and Washington, D.C. These fellows insist, still today, that there are wonderful benefits to be obtained from that NAFTA program against which former GM stockholder Ross Perot warned nationwide television audiences back in 1994, when he spoke of "that great sucking sound." Perot then pointed, prophetically, to such present effects of NAFTA as the continuing collapse of levels of production and employment in the U.S., as a result of the export of U.S. jobs into virtual slave-labor camps in filthy slums located just south of our Mexico border. His case was presented quite simply and accurately, using facts with which no honest and sane person

1. The U.S. standards for modern secondary education were set by Benjamin Franklin's great-grandson, West Point graduate and scientific collaborator of Germany's Alexander von Humboldt, Alexander Dallas Bache, in his model program for Philadelphia. See, Anton Chaitkin, "Humboldt in America," **Executive Intelligence Review**, June 26, 1998, p. 25.

2. Admittedly, such literacy is rare these days. The point is, that an adolescent who had been given a fair chance at a decent, Classical education, would have such skills. Hence, my point is: such competence is within the reach of a typical adolescent, provided that adolescent had been provided a decent education and matching cultural environment.





"Third Wave" cultists (left to right) Newt Gingrich, François Quesnay, and Alvin Toffler. Quesnay's doctrine that "bounty" inheres in the feudalist form of property title to the land, forms the kernel of what became Gingrich's "Contract on America" manifesto.

could disagree today. Similarly, glassy-eyed advocates of "globalization," insist on defending the delusion, that the present, ever-deeper lowering of average physical-economic output per-capita, globally, must be continued, as a general benefit to not only the U.S., but also the world economy. Apparently, such advocates have not mastered even the simplest operations of addition and subtraction.

The fact that, even after the catastrophes of the recent six years, such follies as NAFTA, "free trade," and "globalization," are presently still tolerated opinions in Washington's policy-shaping, is more than sufficient proof, that something is very wrong in what passes for the economic calculations of the majority among today's policy-shapers. Thus, blind faith in mere financial-accounting practice persists, despite the recent twelve months' stunning accumulation of contrary evidence. This takes us beyond the apparent inability of Perot's critics to add and subtract; it reflects two deeper problems, which are the timely subject of this report.

The first, simpler, more immediate of the latter two problems, is, that the stubbornly persisting miscalculations in the economics reports of our government, Federal Reserve Chairman Alan Greenspan, and most other so-called "financial experts," reflect a broader, quarter-century's collapse in the levels of rationality, at nearly all levels of the population. As each older generation has been replaced by generations newly entering adolescence and adulthood, the incompetence of the policy-makers and credulities of the population have reached new depths of irrationality. As I have pointed out recently, this collapse of rationality, in turn, correlates with a continuing down-shift in the composition of employment, away from productive modes of employment, into more or less parasitical, and, therefore, increasingly irrational modes of so-called "services" occupations, such as employment in "financial" and other usually doubtful qualities of "services" employment.[3]

The fact that such a continuing, quarter-century trend, away from productive forms of employment, has been tolerated to the extent it has during the recent quarter century, reflects the deeper, more long-standing problem addressed in this report. If one looks more closely at the evidence, an ominous shortfall in the intellectual development of our population, was already

3. Lyndon H. LaRouche, Jr., "The Eagle Star Syndrome," **Executive Intelligence Review**, August 7, 1998.

taking over the majority of even the presumably literate rations of our population, even prior to the 1964-1972 down-shift into "post-industrial" utopianism. Prior to the assassination of President John F. Kennedy, the problem was, admittedly, marginal, relative to the disastrous situation today; but the intellectual seeds of future economic disaster had already been planted.

Evidence such as comparative studies of the popular literature, entertainment, textbooks, and public policy-debates of the U.S., sampled from a succession of various intervals since the beginning of this century, points toward a leading contributing cause for the problem. In most departments of learning and popular discourse, for example, a relative degeneration of standards of education and literacy was already in progress during the first half of this century, and up through the time of the Kennedy Presidency. By the standard of content-analysis applied to the congressional and comparable oratory since the period of President Franklin Roosevelt's terms in office, a growing ration among today's elected and party officials, such as Speaker Newton Gingrich, are virtually incoherent ranters, of a type which is usually incapable of addressing an important issue honestly and rationally.

Admittedly, the disintegration of public education systems, worsened by that irrationality and illiteracy which has become typical of the popular mass media, has been a factor in this moral decay of the population. The cultural rot shown by audiences' toleration for the decadence of the most popular, most influential of the mass-circulation news and entertainment media, reflects the process of ongoing general collapse of the level of rationality of the population, not only during the recent thirty years, but over the course of the century.[4] A partial exception to this long-standing prevalence of erosion in our national intellectual life, is to be found in so-called "hard science" and engineering from the decades prior to the Kennedy assassination. That noted, with few, and diminishing exceptions, the post-World War II "liberal arts" programs of public school and university education, were predominantly a sham.

Ask, then: What was the reason for this apparently paradoxical contrast between increasingly frivolous "liberal arts" curricula, and a contrasting, continued level of relative competence in scientific and engineering curricula? Why is it, that, despite the half-century or so of intellectual decay in most departments of learning, prior to the 1964-1972 eruption of post-industrial utopianism, a kernel of competence persisted in the area of so-called "hard science" and engineering?

The more obvious answer to that question is, that the cause for that difference in quality of intellectual life between the two categories, was chiefly political. As long as physical-economic and related considerations of national strategic economic security, remained the one department in which education and practice were conducted with serious attempts at competence, self-respecting forms of intellectual life were concentrated, chiefly, in the mathematical-physical, and closely related disciplines.[5]

To account for the suddenness of that collapse of rationality in our nation's policy-shaping processes, which erupted among university populations during the 1964-1972 interval, we must focus upon certain defects in scientific curricula from earlier times, defects which were usually either overlooked, or merely shrugged aside, in the saner times before the Kennedy assassination. The irrationality we suffered during 1964-1972 and later, was already developing, like a fungus, even

4. Exemplary is the science policy of the **New York Times**. Notable are the **Times**'s opposition to Thomas Edison's development of the light bulb, its insistence that the Wright Brothers' experiments should be stopped, and its insistence that Professor Goddard's rockets could never reach beyond the Earth's atmosphere. The pro-Confederacy tradition of the family ownership of the **Times** might explain the publisher's kinship to "Fugitive" minds such as those of Robert Penn Warren, John Crowe Ransom, and William Yandell Elliot. The British connections of the House of Morgan also bear on the newspaper's science policy to such effect. Pro-Confederacy traditions aside, what must be taken into account, is that the U.S.A.'s putatively leading, and most influential daily newspaper is received as credible by so broad, so plainly corrupted a popular audience.

5. Apart from the mathematical-physical and related sciences, the only important niche of rationality was found in the rapidly declining areas of study and performance of those Classical art-forms of poetry, drama, music, and plastic arts which traced their roots explicitly from Classical Greece, especially the exemplary traditions of Homer, Aeschylus, and Plato. Whatever degree of sanity and decency remained in popular art-forms, was rapidly wiped out by the onset and aftermath of the 1964-1972 rampage of the "rock-drug-sex youth-counterculture." The same pattern showed increasingly, during the 1950s and 1960s, in the frequent case a competent production management's efforts were ruined by the incompetence characteristic of the outside influences usually conveyed through the financial-accounting side of the management. Typical of the latter disparity, was the popularization of the lunatic doctrine of "value engineering," promoted through relevant Wall Street propaganda-channels, as early as the late 1950s. The latter doctrine could have been promoted by illiterates who had not laughed heartily at Oliver Wendell Holmes' famous spoof, "The Deacon's One-Horse Shay" ("Built to last for a year and a day").

within those aspects of our nation's pre-1964 intellectual life, such as "hard science," in which *we, otherwise, had still enjoyed that degree of popular rationality of our citizenry which was consistent with our nation's continuing advances in productive forms of employment.* For the purposes of this report, our attention is focussed upon the continuing, pernicious influence of that specific kind of intellectual "fungus" which already polluted the mathematical-physical disciplines during the decades preceding the 1964-1972 eruption of the cult of "post-industrial" utopia.

Restate the preceding point in the following terms. The relevant flaw in those tainted aspects of pre-1964 forms of mathematical-physics and related education, is that specific taint of corruption in pre-1964 scientific education and practice, which prepared our nation—especially its university graduates of the years after 1963—to tolerate the 1964-1972 downshift of productivity, and, thus, to acclimate ourselves as a people, increasingly, to the consequent, subsequent descent, into the "Clockwork Orange" nightmare of "post-industrial" utopianism.

After we have addressed here the key technical error, that of "linearization in the small," which was tolerated within pre-1964 "hard science" education, we shall turn then to the second of the two deeper problems, the deeper, social basis for that disorder. We must focus then upon the origins of the still deeper, literally *axiomatic* implications of that same gradual loss of rationality which took hold during the decades prior to the 1964-1972 "cultural-paradigm shift."[6]

We shall show here, that *every relevant error in the mathematical argument used to defend today's generally accepted economics dogma, is to be traced to relevant defects within those same mathematical methods which were generally accepted in most universities during most of this century, up through the end of the 1960s.* In that, in sum, lies the crux of the problem upon which we focus in this report.

What in Hell Happened with Newton

For example, since the closing months of 1987, the world has watched, with horrid fascination, as the supposed "wonder economy" of recent decades, Japan, destroyed itself before the anxious eyes of officials such as U.S. Treasury Secretary Robert Rubin.

As we have watched this catastrophe unfolding, we have been confronted with the shameful fact, that Japan's post-war reconstruction and later, brilliant industrial progress, prior to the second half of the mid-1970s, had been replaced by the rising influence of a monetarist's gambling mania which is as wild, or even wilder than John Law's famous bubble.[7]

We must recognize the specific quality of lunacy which has lately taken over leading financial circles in Japan, and also a large part of the U.S. population, especially since the combination of the "Plaza Accords"[8] and the October 1987 U.S. stock-market crash. This madness is an echo of the same insanity as the Dutch tulip craze of the Sixteenth Century,[9] or that "Pyramid Club" craze which duped a significant portion of the U.S. population at the close of the 1940s;[10] it is a quality of madness which should remind us of the moral de-

6. For all practical purposes, "rock-drug-sex counterculture," "post-industrial utopianism," and such dionysiac corruption as the influence of Georg Lukacs and the so-called "Frankfurt School," should be taken as a single, common phenomenon.

7. The John Law bubble, also known as the Mississippi bubble, bankrupted France in the 1720s. It was based on a swindle by Scottish gambler John Law, who eventually became the Comptroller General of France. His Mississippi Company was set up in 1717 to sell shares of the Louisiana Territories to the French public, as buyers were told that the Territories were filled with gold, silver, and other natural wealth, and that they would make millions (the promised loot from Louisiana never materialized). A speculative fever took hold, and by December 1719, the original shares were trading at 40 times their original value. But, during that winter, the wealthiest speculators pulled out of the market, and the company collapsed, bringing the investors down with it.

8. At a meeting in New York's Plaza Hotel in September 1985, the Group of Seven finance ministers agreed to lower the value of the dollar against other currencies. Within a short period, the dollar fell by 30% against the yen; by 1988, the yen had risen 86% against the dollar, helping to create a "bubble economy" in Japan.

9. Tulips arrived in the Netherlands from Turkey in 1593, and soon became the subject of a speculative explosion; the bulbs were never planted, and were never even seen by their purchasers, since sales took place by contract. Prices reached staggering heights by late 1636 and early 1637, but in February 1637, the collapse was on, and thousands of investors were bankrupted.

10. Pyramid Club mania swept the United States in 1949, making headlines in **Time** magazine, and other popular journals. In reviewing 1949, in its 1940-1950 volume of **The Fabulous Century** (Time-Life Books, 1987), Time, Inc. runs a reprise of the fad, with a **Los Angeles Herald-Examiner** photo of a California winner, waving fistfuls of money. "Mrs. Clyde grabs the loot she has won in a Pyramid Club. A craze in 1949, the clubs required members to pay, say, one dollar each, and recruit two others at a dollar a head. After 12 days a member theoretically won $2,048—but most clubs folded because of the decreasing mathematical probability of finding new members."

The same sophistry, "See, you can't lose in this game," which was the selling-point for the spread of the Pyramid Club mania, was the argument made to sell the "futures" swindle to those duped into the "derivatives" mania.

Rembrandt van Rijn, "Belshazzar Sees the Handwriting on the Wall" (c. 1636).

pravity which was characteristic of Georgian England from the time of the South Sea Island and John Law bubbles, the depravity which Hogarth depicts in his **The Rake's Progress**.

Industrial Japan has been ruined, through a takeover of the nation's financial markets and key party leadership, by a present generation of prodigal sons: those pampered, "Third Wave" wastrels, whose wild miscalculations relied upon the so-called "artificial intelligence" provided by aid of the combination of a "handi," an Internet connection, and a personal hand-held calculator.

What menaces us today, is far worse than some passing, crazy fad. The madness in the eyes of these young monetarist fanatics of Japan (and elsewhere) should remind us, ominously, of Europe's rampaging hordes of Fourteenth-Century Flagellants.[11] This younger generation, in Japan, and also elsewhere, typifies a ruling stratum, like Babylon's Belshazzar, whose role today is that of a caste which lacks the moral fitness to survive. Such a political class, in Japan, or elsewhere, will not survive; either it will be soon swept aside, and replaced, or the existing economies as we have known them, will be plunged into a global spiral of self-disintegration.

This madness which has taken over today's Japan, should be seen as an ugly warning to the monetarist tycoons of Wall Street and London. No economy can run forever on the fictitious wealth represented by an outpouring of depreciating paper in the form of those recklessly inflated "Monopoly" dollars which flood the attempts to bail out a bottomless world financial system.[12] There is little relevant difference between the combined performance, since 1979, of Federal Reserve Chairmen Paul Volcker and Alan Greenspan, and that of those German money-managers of 1921-1923 who, earlier, wiped out a national currency, their own, in the famous Weimar hyperinflation of 1923. "Buy 'Boardwalk,' anyone?"

What kind of mathematical ideology has led most of the world's governments and financial institutions to miscalculate so tragically? To answer this question, we should focus our attention, first, upon what passes for mathematical skills among those pitiable creatures of Japan and Wall Street who follow in the footsteps of Bertrand Russell, Norbert Wiener, and John von Neu-

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11. William F. Wertz, Jr., "The Lessons of the 14th-Century Dark Age," **The New Federalist,** June 29, 1998, pp. 5-8.

12. Admittedly, the collapse of Russia's financial and monetary system is an awful development, especially for western Europe, notably for a Germany which is Russia's most important creditor. However, the crisis of Japan is far worse than the Russia case, for the world at large. Russia is a victim of the reform which was imposed upon it from outside. Japan typifies the rot at the core of the IMF system. The estimated $1.5 trillions bankruptcy of Japan, is linked directly, chain-reaction fashion, like a detonator, to an approximately $140 trillions "derivatives" bubble in the world's financial system as a whole. Thus, the chain-reaction effects of a Japan collapse will rip through the world's dominant financial and monetary institutions in a way which is far more significant than the collapse of Russia's present financial system. Hence, our emphasis on the case of Japan, here.

Indonesian currency traders, 1998. "What menaces us today, is far worse than some passing, crazy fad," LaRouche writes. The younger generation in Japan, and elsewhere, typifies a ruling stratum, likeBabylon's Belshazzar, "whose role today is that of a caste which lacks the moral fitness to survive."

It is within the reach of any among that same, presently vanishing species of literate secondary-school graduates to which we referred at the outset, to reconstruct the crucial proof, that Sir Isaac Newton's formulation of a mechanistic notion of so-called "action at a distance," was a hoax, nothing more than a dubious parody of Johannes Kepler's earlier discovery of the principled characteristics of orbital motion within our solar system.[13]

Equally significant, ask this. After Carl Gauss demonstrated conclusively, by the case of Ceres, that Kepler had been correct, and Newton's method intrinsically wrong, why did the influence of Newton's followers remain *politically* hegemonic in most of both the English-speaking and positivist currents of Nineteenth-and Twentieth-Century secondary and university education world-wide?

mann: that pathological, "Third Wave" style in mathematical thinking, which dominates the circles presently engaged in bankrupting the world's present global financial and monetary systems. That lunatic variety of mathematics represents the more obvious cases; but, as we have already stressed, to discover the corruption which led to Wall Street's tolerance for John von Neumann's "chaos theory" and similar cults, we must focus upon the susceptibility which is the outgrowth of a certain aspect of a certain, centuries-long current of modern European thinking about mathematics.

To begin, trace the modern history of this problem, as follows. Begin with the case of Newton: not only "Third Wave" freaks such as Alvin Toffler and House Speaker Newton Gingrich, but, also, Sir Isaac Newton. First, as we have already emphasized, recognize the degree to which the pathological element in today's popular opinion about mathematics and economics, is at the center of the policy-making responsible for the presently accelerating, terminal process of disintegration of the world's economy. Then, after that, as we have promised, look at the same problem on a deeper level.

Add to those questions, the following qualification, of direct bearing on the subject of the present report. What is the relevance of the mathematical method expressed by such toleration for Newton's elementary error, to the widespread miscalculations underlying the presently ongoing disintegration of the world's financial and monetary systems?

To pick up the threads of the Newton hoax—and, it was a willful hoax,[14] trace European civilization's history of mathematics since Plato's Athens of the early to middle Fourth Century B.C., as Plato and his associates reflected on mathematical paradoxes already identified by the earlier work of Pythagoras on such topics as mu-

13. Johannes Kepler, **The New Astronomy**, translated by William Donahue (Cambridge, U.K.: Cambridge University Press, 1992), and **The Harmony of the World by Johannes Kepler**, translated by E.J. Aiton, A.M. Duncan, and J.V. Field (Philadelphia: American Philosophical Society, 1997). Also, see Jonathan Tennenbaum and Bruce Director, "How Gauss Determined the Orbit of Ceres," **Fidelio**, Summer 1998.

14. See below on the influence of Venice's Paolo Sarpi in creating and shaping the establishment of Seventeenth-Century English empiricism. Also notable, in the perpetuation of the Newton hoax, was the role of another Venice agent, the same Paris-based Abbot Antonio Conti who became, in fact, the "Josef Goebbels" of the Newton myth.

sical tuning and the existence of what we call "irrational numbers." We shall indicate why those specific topics are of exemplary relevance for understanding the leading problems of mathematical economics today.

From Plato's time, onward, the foundations of modern European civilization have developed around a debate between two classes of opinion bearing upon the subject of mathematics. The one is represented by the followers of Plato and his Academy of Athens; the opposing faction is represented by those commonly classed as "the reductionists." In academic circles, the reductionists of Classical and Medieval times, are usually recognized by such names as Eleatics, materialists, sophists, and Aristotle. It is the common fallacy of the method used by each and all of the second group, the reductionists, which is key to the mathematical aspects of the policies responsible for today's onrushing, global financial collapse. For convenience, let us call the first faction, Plato and his followers, *the physicists*, and the latter, Aristotle, et al., *the nominalists*.[15]

Identify the issue in the modern history of mathematics in the following way. Pose the question: Why is it, that although Newton's notions of universal gravitation are algebraic parodies of the earlier work of Kepler, Gauss's work showed why Kepler's original approach, that of Leibniz's calculus, works, whereas Newton's does not?[16] Where lies the source of that difference?[17] The solution to that apparent Kepler-Newton paradox, takes us to the core of the issues of mathematical economics today.

What Should We Measure?

Logical positivists, including such devotees of Bertrand Russell as Norbert Wiener and John von Neumann,[18] insist that the system of mathematics, and therefore also mathematical physics, must be reduced to the elaboration of a set of simple, *a priori* assumptions, including those respecting space, time, and magnitude.[19] Deductive consistency with such *a priori* design, demands, that the elementary connections linking the successive stages of any action occurring within that system, must be considered to be linear, as Newton presumed, and as did Leonhard Euler and Augustin Cauchy.[20] Those are the essential, false, reductionist assumptions, which underlie the mathematical methods commonly employed by financial accountants, and others, ploughing the fields of economic analysis and forecasting today. That set of false assumptions, merely typified by the case of Bertrand Russell, et al., is key to understanding the intrinsic incompetence of all heretofore generally taught methods of economic analysis and forecasting.

Since the work of Plato, notably including his **Timaeus**, the current of physical science leading through Nicolaus of Cusa, Leonardo da Vinci, Kepler, Leibniz, and Gauss, has divided natural phenomena into two general classes. Cusa, and these followers of his founding of modern experimental physical science, insisted that the differences between the two general classes, are defined by *measurement*, rather than by the deductive methods associated with *a priori* hypothesis. Kepler, following Plato, Cusa, Luca Pacioli, and Leonardo da Vinci, assorted the general classes of phenomena between those whose characteristic action is consistent

15. On the significance of emphasizing Plato's role as a physicist, see our references to Bernhard Riemann's 1854 habilitation dissertation (*Über die Hypothesen, welche der Geometrie zu Grunde liegen*, **Bernhard Riemanns Gesammelte Mathematische Werke**, H. Weber, ed. [New York: Dover Publications reprint edition, 1953]). *Nominalist*, as used by me, here, emphasizes the reductionists' axiomatic reliance upon formalism, such as that of Aristotle and his followers, or the Okhamite followers of Paolo Sarpi and Antonio Conti.

16. As Leibniz explained the issues, in his attacks upon Descartes, and then Newton, what Newton tacked onto a later edition of his writings, was not a calculus at all. Indeed, today's textbook calculus is largely the work of Augustin Cauchy, who replaced Newton with a castrated version of the Leibniz calculus, a version from which Leibniz's principle of the infinitesimal of non-constant curvature had been eliminated (by the notorious "Cauchy fraction"). From a formal standpoint, the history of the calculus begins with the work of Kepler, especially Kepler's discoveries stemming from treatment of the implications of the elliptical orbit of Mars. Kepler's pioneering approaches, as developed, chiefly, by Leibniz, and then as the hypergeometry (e.g., modular, multiply-connected functions) of Gauss and Riemann, focus upon the crucial role of characteristics expressed as non-constant curvature in the infinitesimally small, excluding the Newton-Euler-Cauchy hoax, of axiomatically presumed linearity in the infinitesimally small.

17. Obviously, if that question is not posed, the answer will not be sought; in that case, it were not likely that the unsought answer would be found.

18. Aristotle Society devotee Russell emphasized that he recognized no functional difference between his self-identification as a "radical empiricist" and the logical positivism of continentals such as the circles of Ernst Mach.

19. e.g., Alfred N. Whitehead and Bertrand Russell, **Principia Mathematica** (Cambridge, U.K.: Cambridge University Press, 1994, reprint of 1927 edition).

20. Euler committed a celebrated fraud, in which he purported to prove a principle of simple, linear continuity, by deriving this, as a theorem, from a form of geometry which already had the same theorem embedded within it, *a priori,* as an axiom of the system. Cauchy's fraction, which carried Euler's fraudulent assumption over into a deformation of the Leibniz calculus, has the same character and implications.

with the implications of the Golden Section,[21] and those lower species of existence whose characteristics were not consistent with this standard.[22] Since the Nineteenth Century, we have assigned the term "entropy," to the lower species of existence; the term I use, anti-entropy, to avoid the recent decades' popular corruption of the term "negentropy,"[23] typifies that superior type, so identified by Pacioli, Leonardo, and Kepler.

The layman should not be put off by my unavoidable reference to certain historical-technical matters here. The highly practical—indeed, life-or-death—implications of this crucial technical point will be made clear soon enough.

There are three types of phenomena which meet the Plato-Kepler standard for processes of anti-entropic *characteristics* in the infinitesimally small: living processes generally, human cognition, and, as Kepler emphasized, the lawful ordering which is the underlying characteristic of the universe as a whole. In turn, the modern comprehension of such distinctions in characteristics, as extended into the infinitesimal, was continued beyond Kepler, by Leibniz. Leibniz's treatment of this matter was centered in his addresses to the topic of *non-constant curvature in the infinitesimally small*, and to the related topic of *analysis situs*. This Kepler-Leibniz development of the notion of multiply-connected manifolds, was brought to a relative degree of mathematical perfection by the work of Carl Gauss in founding what became known under the rubrics of *modular*, or *hypergeometric functions*.[24] This was featured as part of the same topic in Bernhard Riemann's treatment of hypergeometric functions,[25] and his related addresses to the topic of Leibniz's notion of *analysis situs*.[26] My own original discoveries in the field of mathematical economics rely, inclusively, on the implications of Riemann's discoveries.

Riemann's role in clarifying the mathematical-physics issues, was crucial for all modern science, including any competent form of mathematical economics. Although his solution to the problem was an original work of genius, that in the strictest sense, the problem he addresses, and largely solves in his 1854 habilitation dissertation, is an issue as old as Plato's work.[27] That problem, so situated historically, is key for solving the problem which is the subject of this report, a solution on which the continued existence of the present world civilization may depend, even in the short term.

The formalists, including such followers of Aristotle as the Immanuel Kant of his famous *Critiques*, assume the self-evident existence of certain axioms, without any proof other than so-called "intuition." These include, for example, the axioms of the usual classroom and textbook varieties of Euclidean geometry. Through mistaking deduction for rationality, as Aristotle and Immanuel Kant do, these formalists build their system around a deductive notion of *extension*, such as Newton's "action at a distance." For Newton, as for Hobbes, Locke, Mandeville, David Hume, Adam Smith, Jeremy Bentham, Leonhard Euler, Laplace, Augustin Cauchy, and other philosophical nominalists, extension is implicitly presumed, by intuition, to be linear, especially in the infinitesimally small.[28]

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21. e.g., the implications of the five Platonic solids.

22. Johannes Kepler, "The Six-Cornered Snowflake," translated by Colin Hardie (Oxford: Oxford University Press, 1966).

23. By the influence of Norbert Wiener's cult of "information theory."

24. See, Tennenbaum and Director, op. cit.

25. e.g., on the subject Abelian functions and hypergeometric functions otherwise.

26. Bernhard Riemann, *Theorie der Abel'schen Function Lehrsätze aus der Analysis Situs für die Theorie der Integrale von zweigliedrigen vollstaendigen Differentiallen,* in **Bernhard Riemanns Gesammelte Mathematische Werke**, H. Weber, ed. (New York: Dover Publications reprint edition, 1953). A partial English translation can be found under the title, *Riemann's Surfaces and Analysis Situs,* in David Eugene Smith, ed., **Source Book in Mathematics** (New York: Dover Publications, 1959).

27. "It is well known that geometry presupposes not only the concept of space but also the first fundamental notions for constructions in space as given in advance. It gives only nominal definitions for them, while the essential means of determining them appear in the form of axioms. The relation of these presuppositions is left in the dark; one sees neither whether and in how far their connection is necessary, nor *a priori* whether it is possible.

"From Euclid to Legendre, to name the most renowned of modern writers on geometry, this darkness has been lifted neither by the mathematicians nor by the philosophers who have labored upon it. The reason of this lay perhaps in the fact that the general concept of multiply extended magnitudes, in which spatial magnitudes are comprehended, has not been elaborated at all. Accordingly I have proposed to myself at first the problem of constructing the concept of a multiply extended magnitude out of general notions of quantity." Bernhard Riemann, *On the Hypotheses Which Lie at the Foundations of Geometry,* translated by Henry S. White, in David Eugene Smith, ed., **A Source Book in Mathematics** (New York: Dover Publications, 1959), p. 411.

28. While Aristotle was already implicitly a nominalist, that appellation must be applied with special force to the cases of the British empiricists and continental Cartesians and positivists. Modern empiricism, and positivism after it, was established by the influential Venetian Paolo Sarpi, a revision of Aristotle's method which Sarpi based explicitly on the model of the medieval obscurantist William of Ockham (of "Occam's Razor" notoriety). The form of empiricism and positivism popularized during the Eighteenth and Nineteenth Centuries, was a product

What the formalists do, is to view the mathematical physics which they have come to adopt (up to each relevant present moment of their work) as a formal mathematical system of the reductionist type indicated (e.g., Aristotelean). *With only a few exceptional cases, which are of virtually no relevance to our discussion here, the mathematical systems of the formalists are each based upon the common assumption of Newton, Euler, Cauchy, Clausius, Bertrand Russell, John von Neumann, et al.: the deductive assumption that extension is, to all practical intent, "linear in the infinitesimally small."* From Aristotle, through Hobbes and Immanuel Kant and Cauchy, that typically reductionist assumption, of "linearity in the infinitesimally small," implies, mathematically, that the universe as a whole is governed by a principle of universal entropy. For that specific reason, anything which a reductionist, such as a financial accountant, says about the subjects of human behavior, living processes, or the universe in general, is, at its very best, axiomatically false.

Gauss' discovery of the orbit of Ceres presents a crucial demonstration of this point; the distinguishing characteristics of processes, for the purposes of a calculus, are located precisely in those facts which members of Conti's salons, such as Berlin's Leonhard Euler, insisted do not exist. These characteristics are located, precisely, within the non-linearity of the curvature of a process in its infinitesimally smallest interval.[29] In other words, in the typical case, the physical-space-time curvature of the action expressed in the most infinitesimally small, is never, contrary to Euler et al., the reductionist's "straight-line action at a distance." In the real physical universe, as for Carl Gauss, the action expressed in a measurable form, within the infinitesimal interval, has some distinctive curvature, a curvature which echoes the characteristic of the process as a whole.[30]

This, as Plato and Kepler had insisted before Leibniz or Gauss, is precisely the distinction in *characteristic* which sets an anti-entropic process absolutely apart from an entropic one. This is the most crucial feature of the original discovery which Riemann presents in his 1854 habilitation dissertation. *We must never presume to define the characteristic action in a multiply-connected physical-space-time manifold, from an* a priori*, formalist standpoint; such questions must be answered, not in the domain of formalist mathematics, but, rather, belong to the realm of experimental physics.*[31]

Riemann's argument to this effect, was already a crucial argument contained implicitly within Plato's **Timaeus**, and was also a central argument of Kepler's founding of the first comprehensive mathematical physics in his **New Astronomy** and related works. This same distinction, should be recognized as the fundamental theorem of any competent type of mathematical economics. This theorem is key for understanding the intrinsic incompetence of virtually all of the actually or implicitly mathematical analysis and forecasting presented by government and related circles today.

The key principle to be stressed in the remainder of this report, is the following reflection upon the point we have presented immediately above. *To be competent, mathematical-economic analysis must lay the primary emphasis upon measuring the characteristic relative anti-entropy of the economic process considered as a whole.*[32]

The principled form of that measurement must be made in the same general form I have expressed this in my specification for an anti-entropic set of simultaneous inequalities.[33] It is the measurable changes in (Rie-

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of the influence of another Venice agent, the leading adversary of Leibniz during Leibniz's lifetime, Paris-based Abbot Antonio Conti. Conti was the founder of what became known as the Eighteenth Century "Enlightenment." Newton was a protégé of Conti, while relevant enemies of Leibniz's work, such as Leonhard Euler, Immanuel Kant, Augustin Cauchy, et al., were members of cult-circles established by Conti during the first half of the Eighteenth Century.

29. Tennenbaum and Director, op. cit.

30. ibid.

31. "This path leads out into the domain of another science, into the realm of physics, into which the nature of this present occasion forbids us to penetrate." Riemann, *On the Hypotheses Which Lie at the Foundations of Geometry,* op. cit., p. 425.

To the degree that one operating manifold of validated physical principles is of a higher cardinality than another, we may conclude that the characteristic of an economy operating on the basis of the higher technology will be greater than that of an economy relying upon the less advanced manifold. However, the exact characteristic must be determined physically, not formally. This does not imply that the physical universe is in some way irrational; it signifies the elementary significance of living in a universe which is a multiply-connected manifold, in which addition of new principles depends upon crucial validation of discoveries by experimental methods.

32. On this point, today, since the popularization of Professor Norbert Wiener's "information theory" hoax, it is strictly necessary to avoid the popularized connotations of use of what Wiener transformed into the cult terms "negative entropy," or "negentropy." Otherwise, ignorant popular opinion among today's academics will nod energetically, saying, "Yes, we must use the H-theorem."

33. Cf. Lyndon H. LaRouche, Jr., "An 'American Century' Seen as a Modular Mathematical Orbit," **Executive Intelligence Review**, July 24, 1998, p. 30.

mannian) relative anti-entropy[34] of the whole process, as expressed in per-capita and per-square-kilometer terms, which defines the relative characteristic distinguishing a relatively more successful stage of economic development, from a relatively poorer one. This must be defined, and measured, in Riemann's sense of a physical, rather than aprioristic characteristic.[35]

Hobbes, Quesnay, and Smith

Presently, virtually all professional economics taught in our universities, is premised upon blind faith in those nominalist assumptions which were introduced, as empiricism, to the England of the Venice-linked Cecil family, by the agents and other followers of Venice's then-ruling figure of the post-1582 period, Paolo Sarpi. After Sarpi, these influences evolved into those forms of the British and French "Enlightenment" associated with the followers and associates of Venice's later, Paris-based spy-master, and most virulent Leibniz-hater, Abbot Antonio Conti. Notable in these connections, are Sarpi's personal lackey, the notorious Galileo Galilei, Sarpi's agent Sir Francis Bacon, Galileo's mathematics student and Bacon intimate Thomas Hobbes, John Locke, Bernard Mandeville, Physiocrat Dr. François Quesnay, Adam Smith, and the first head of the British Foreign Service, Jeremy Bentham. The essential features of that empiricist view are as I have outlined the principles of the empiricist form of reductionist method, here above.

Hobbes, for example, defines society as, virtually, a mass of percussively interacting, irregularly-shaped billiard balls. The varieties of elasticity and "spin" supplied to the individual interactions are presumed to be variants upon the theme of "The Seven Deadly Sins." If one knows the relevant axiomatic characteristics of mathematical thinking which "Leporello"-like Galileo adopted directly from the instructions of his master Sarpi, there is no doubt that we must emphasize the role of empiricist mathematical education in reading the way in which Hobbes' conception of society was formed, as a kind of statistical "gas system," of particles "each in war against all."

The subsequent addition of the naively deductive assumption of "action at a distance," to Hobbes' simply percussive interaction, made the model more complicated, but, for our purposes here, the relevant, axiomatic characteristics are not altered. "Action at a distance" is, in fact, adding "at a distance" as an implicitly included feature in the repertoire of percussive interactions; this addition serves as a ruse for providing the pretense of contextual universality for the system of percussive interactions.

After Hobbes, beginning with John Locke, the English empiricist school of political economy reinterpreted this expanded form of Hobbes' percussive-statistical model as the basis for what became the modern doctrine of "free trade." Like Hobbes, his liberal empiricist successors, Locke, Mandeville, Smith, Bentham, et al., insisted that their "kinetic gas theory" model of society, based upon the model of "The Seven Deadly Sins," was the only "natural" form of the social process, with which alleged tyrants such as France's Jean-Baptiste Colbert (or, Alexander Hamilton, John Quincy Adams, Friedrich List, or President Abraham Lincoln) must not "interfere."

A frankly satanic element, which is axiomatically implicit in the liberals' definition of their "free trade" dogma, was featured frankly in the arguments of the most malicious among liberal empiricists, such as Mandeville, who served as an inspiration for Mont Pelerin Society founder Friedrich von Hayek, and also Jeremy Bentham. For the purposes of our report, the clinical case of the utterly damnable Physiocrat, Dr. François Quesnay, is most interesting for our consideration here.

Quesnay, like the notorious Voltaire, belonged to that Venetian circle which Paris-based Venice spy-master and Abbot Antonio Conti introduced to France. Quesnay was associated with the most corrupt circle infiltrating the court of Louis XV. It was from the writings of Quesnay and of Quesnay's Physiocratic follower and "free trade" advocate, A.R.J. Turgot, that Lord Shelburne's British East India Company agent, Adam Smith, plagiarized the important systematic features of the 1776 **Wealth of Nations**.

The political root of Quesnay's writings, is the most

34. In the LaRouche-Riemann method, three measurements are required. The first, my own original discovery, is expressed by the system of simultaneous inequalities which I counterposed to the arguments of Norbert Wiener and John von Neumann. The second, my own argument, is attributing anti-entropic changes in the characteristic physical-economic productivity of a society to accumulated advances in a combination of valid discoveries of both physical and Classical-artistic principles. The third, is my adoption of Riemann's notion of a multiply-connected manifold as the basis for defining the intellectual matrix which governs the possibility of realized increases in the physical-economic productive powers of labor. For this purpose, *potential relative population-density* of an entire culture, is a term which is virtually interchangeable with "productive powers of labor."

35. ibid.

virulent of the pro-feudalist, anti-nation-state factions in earlier, Seventeenth-Century France, the notorious *Fronde*.

This *Fronde*, early associated with the Anglo-French feudal family of Beaufort, is best known in history for its treasonous military and related enterprises against Cardinal Mazarin, and Mazarin's famous protégé and successor, Minister Jean-Baptiste Colbert. It was Louis XIV's alliance with the *Fronde* faction, over Colbert's opposition to this policy, which plunged France into ruinous wars, Louis XIV playing thus into the hands of the disgusting Duke of Marlborough's Anglo-Dutch financier oligarchy. These wars dominated the late Seventeenth Century and the period of the relatively brief reign of England's Queen Anne. These were the wars through aid of which the butcher William of Orange, and Orange's protégé, George I, were brought to power in England.[36]

Quesnay was among the prominent, pro-*Fronde* propagandists devoted to attempting to eradicate the intellectual influence of Colbert and Leibniz from France. Taking Turgot's influence duly into account, all of Quesnay's work, and Adam Smith's extensive intellectual debts to Quesnay, are to be understood from the standpoint of Venice's influence behind both the *Fronde* and the financier-oligarchy's establishment of the Anglo-Dutch monarchy of Orange and Hannover.

Typically *Frondist*, the principal axiomatic feature of Quesnay's Physiocratic doctrine, is the assertion of a divine right of the feudal landed aristocracy to rule its landed estates free of interference by any central national authority. To this effect, Quesnay insists upon the paganist doctrine, that all wealth originates as the bounty of nature, rather than as the fruit of the intelligence of the human will. Thus, he insists, the "bounty" inheres "naturally" in the feudalist form of property-title to the land, and that that "bounty" belongs, therefore, to the feudal landlord who has received the property title as a divine gift. That is the axiomatic kernel of Quesnay's entire doctrine, especially that pro-feudalist doctrine of *laissez-faire* from which Adam Smith borrowed so liberally on behalf of his own doctrine of "free trade," and from which "Third Wave" cultist Newton Gingrich borrowed the kindred, pitiably contemptible doctrine of his own Jacobin-style "Contract on America" manifesto.

Quesnay's pagan worship of Nature and all things mythically natural, is one of the keys for understanding how the present intellectual, and moral corruption of the United States' government and population has been accomplished. Opposite to pagans such as Quesnay, for the Christian, the most relevant connections are obvious ones: the essence of satanism, such as that of Quesnay's Physiocratic doctrine, is the assertion which counterposes satanic Gaia's Nature, as the enemy, to the Judeo-Christian notion of man and woman as made in the image of the Creator. The connection to be made is the following.

If we accept, as the challenge of the manifest paradox, the proposition that the individual mortal person is made *essentially* as a replica of the Creator of this universe, what is the crucial experimental evidence which enables us to discover a *provable*, validated meaning for those verses from **Genesis** 1? The only proof which satisfies that requirement, is the evidence that mankind increases its power over the universe through realization of validatable discoveries of both physical principle and of those Platonic, Classical-artistic principles properly informing the relations among human individuals.[37]

This supplies unique significance for my own revival and further development of the Leibnizian science of physical economy. The only form in which mankind's increase of our species' lawful power over nature is expressed in both general and rigorous terms, is the same standpoint in physical economy represented, typically, by my anti-entropic set of simultaneous inequalities.

The reciprocal implication of the LaRouche-Riemann Model for *anti-entropic increase of* the potential relative population-density of an entire society, is that the anti-entropic change, for the better, in the implicitly measurable characteristic of that physical economy, expresses the function of individual human cognition in generating those discoveries of combined physical and Classical-artistic principle, from which the anti-entropic change in characteristic is derived.[38] Thus, *the prin-*

36. Cf. H. Graham Lowry, **How the Nation Was Won**, Vol. I (Washington, D.C.: Executive Intelligence Review, 1988).

37. Lyndon H. LaRouche, Jr., "Russia Is Eurasia's Keystone Economy," **Executive Intelligence Review**, March 27, 1998, and "The Substance of Morality," **Executive Intelligence Review**, June 26, 1998.

38. See my following treatments of this subject-matter of the role of interacting discoveries of physical and Classical-artistic principles. "Russia Is Eurasia's Keystone Economy," **Executive Intelligence Review**, March 27, 1998; "The Principles of Long-Range Forecasting," **Executive Intelligence Review**, April 17, 1998; "The Substance of

ciple of action which underlies the anti-entropic characteristic of a successful form of society, is the developable, sovereign, *world-historical* cognitive potential of the individual human personality.

Just as the evolutionary development of the biosphere[39] supersedes the generality of ostensibly non-living processes, so the sovereign cognitive processes inhering in each human individual supersede the generality of non-human processes. To attempt to superimpose the characteristic of non-living processes on the biosphere, is to practice death; to attempt to superimpose characteristically non-human forms of "natural" processes upon mankind, as Quesnay did, and as Britain's heathen, Gaia-worshipping Prince Philip does, is a wildly dionysiac scheme, for imposing a demographic collapse far worse than anything attempted by Adolf Hitler's regime. Quesnay's followers, like Prince Philip, seek to degrade humanity to the population potentials and conditions of life of the wild beasts. Quesnay's doctrine typifies the state of mind we must associate with plainly satanic implications of the pagan worship of "natural nature."

If the anti-entropic development of human society does not come from the anti-entropic action of human cognition, whence could "profit" come? If there is no anti-entropy, then the potential relative population-density of humanity were fixed in the way in which the ecological potential of each among all lower species is relatively fixed. There could be no anti-entropic gain, hence, no "profit" to society as a whole, at least not in the typical U.S. citizen's commonly understood notion of growth of a national economy.

In that case, as for Quesnay and the British East India Company, "profit" occurs only in the form of a tax which landlords, or financier oligarchs, for example, might impose, as parasitical looting, upon those parts of the human population unable to resist such depredations. In fact, Quesnay's "bounty of nature" occurs only as the landlord's bounty from looting of the subjugated social strata: not as a gain to society as a whole, but, rather, as a deduction from the previously existing levels of output of the society as a whole.

Shifting attention away from the landed aristocracy, to Adam Smith's Venetian-style, Anglo-Dutch financier oligarchy, the modern cult of "free trade" replaces Quesnay's "bounty of nature" with a queer assumption of its own. It presumes, as Adam Smith does, that the source of growth of wealth is the random, parasitical (e.g., "cheapest price") interactions of a Hobbesian-like society operating, without interference, according to the statistical principle of "war of each against all." That was the argument underlying John Locke's doctrine of property. That was the explicitly satanic teaching of Bernard Mandeville's **The Fable of the Bees**.[40] That is the doctrine of "free trade" presented by Adam Smith, Jeremy Bentham, John Stuart Mill, et al. Norbert Wiener adopted the same form of argument in presenting his H-theorem argument for his "information theory" hoax.

In short, there never was any rational basis for today's widespread presumption, that "free trade" fosters an increase in wealth; such beliefs were never more than a matter of arbitrary blind faith by Enlightenment paganists such as Quesnay. In fact, as the argument of Clausius, Kelvin, et al. goes, the predetermined result of any characteristic form of economic action which is analogous to "free trade," must be entropy, the degeneration and "heat death" of any system foolish enough to adopt such a policy.

If, as the liberal economists' argument requires, there is no absolute growth in the productive powers of labor, no actual profit, then the increase of per-capita rates of localized, nominal profit, can occur only as it did under the influence of such follies as the U.S.A.'s Garn-St Germain and Kemp-Roth legislation. In these cases, the local profit of some, at the expense of many, assumes a purely immoral, parasitical character, to such effect that a constant rate of profit on the nominal capital so accumulated can occur only by looting the pre-existing economy virtually into the ground.

Thus, to the extent the influence of the East India Company's Haileybury School economists influenced European civilization's practices, the kinds of so-called "business cycles" Marx portrays in Volume III of his **Capital** did recur during the Nineteenth and early Twentieth Centuries. Contrary to Marx, these were not inevitable or natural cycles, were never intrinsic to the form of capitalism represented by the Franklin, Hamilton, List, Carey, American System of Political-Economy. They were strictly by-products of tolerating the

Morality," **Executive Intelligence Review**, June 26, 1998; "Where Franklin Roosevelt Was Interrupted," **Executive Intelligence Review**, July 17, 1998; "An 'American Century' Seen as a Modular Mathematical Orbit," **Executive Intelligence Review**, July 24, 1998.

39. Vernadsky's *noösphere*, for example.

40. Bernard Mandeville, **The Fable of the Bees, or Private Vices, Public Benefits** (London: 1934, reprint of 1714 edition).

impact of the inherently parasitical British "free trade" system within the realm of international trade and finance.[41] These were by-products, not of capitalism, but of what President Franklin Roosevelt denounced as "British Eighteenth-Century methods."[42]

The worst was yet to come. It came with the Trilateral Commission's disastrous role in destroying the U.S. economy under, especially, President Jimmy Carter and the influence of Vice-President and President George Bush. It is arguable, that the Trilateral Commission, whose policies were packaged, during 1975-1976, as the Cyrus Vance, Zbigniew Brzezinski, Miriam Camp "Project 1980s," has done more damage to the economy and people of European culture, during the past twenty-odd years, than any war since 1648. Beginning the changes in U.S. economic policy during 1966-1967, the U.S. economy was deliberately collapsed, reaching a zero-point about the time of President Richard Nixon's folly in destroying the Bretton Woods system, and replacing it, beginning mid-August 1971, with what quickly became the disastrous "floating exchange-rate system."

To understand the U.S.A.'s position and role in the currently ongoing disintegration of the world's financial and monetary system, we must situate the catastrophes introduced under President Jimmy Carter within the context pre-defined by the preceding, 1971-1974 measures under direction of London's agent of influence Henry A. Kissinger. Most of the damage was already done by the time a discredited President Carter, defeated for re-election, left office, at the beginning of 1981.[43] The kindred measures enacted under Presidents Reagan, Bush, and Clinton, have also proven disastrous, but these must also be appreciated as merely consistent with the trend established by the wrecking of the U.S. already done under the Trilateral Commission's Carter.

Situate the characteristic lunacy which has taken over U.S. economic policy since August 1971, in the light of the case of Quesnay.

Crucial Issues of Capital Formation

Typical of the lunacy which has prevailed in U.S. economic policy-shaping during the recent two decades, are the monstrously immoral, as well as costly effects of the Garn-St Germain and Kemp-Roth bills. To understand the significance and effects of these bills adequately, we must view them as supplementing Federal Reserve Chairman Volcker's wholesale ruin of the Savings and Loan and other primary savings institutions.

Both Garn-St Germain and Kemp-Roth, which played a key role in promoting the Vice-President Bush era's looting of the Savings and Loan banks and the related pandemic of "junk bond" trafficking, were the looniest forms of financial speculation afoot, until the ultimate in psychedelic accounting practices, the "derivatives" swindle, took over, in the aftermath of the 1987 New York stock-exchange crash.

Seeing these and related bills in the context of Volcker's Trilateral wrecking of the U.S. financial system, illustrates with especially shocking clarity the always disastrous effects of introducing policies based upon Quesnay's *laissez-faire* doctrine to modern society. The essential facts of that case are as follows.

During the Spring of 1979, Volcker himself, while in Britain, where he was campaigning for nomination as President Carter's new Chairman of the U.S. Federal Reserve System, affirmed his adherence to the doctrines of the Trilateral Commission. He stated, that he considered "controlled disintegration of the economy" to be acceptable policy. This recipe, copied directly from the New York Council on Foreign Relations' "Project 1980s" manual,[44] was implemented immediately after Carter's nomination of Volcker to that post. The policy was put into effect during October 1979, immediately after the confirmation of Volcker's appoint-

41. The so-called economists explicitly associated with the Haileybury School, included Adam Smith, Jeremy Bentham, Thomas Malthus, David Ricardo, and, at a later time, John Stuart Mill and his marginal utilitarian school. The Karl Marx whose education in economics was shaped chiefly under the direction of the British Foreign Service's David Urquhart, not only belongs, properly, to the same school in economics thinking, but was among the most vigilant defenders of the appropriateness of the "free trade" principle, in vigorous opposition to the American System of political-economy in general, and to Friedrich List and Henry C. Carey in particular.

42. Elliott Roosevelt, **As He Saw It**, 1st ed. (New York: Duell, Sloan and Pearce, 1946), p. 36.

43. The most important of the changes under President Carter's administration, are identified in my already referenced "When Franklin Roosevelt Was Interrupted."

44. Fred Hirsch, former editor of the London **Economist**, writing in **Alternatives to Monetary Disorder** (New York: Council on Foreign Relations, 1977), affirmed that "controlled disintegration in the world economy is a legitimate object for the 1980s." Paul Volcker delivered the Fred Hirsch Memorial Lecture at Warwick University in Leeds, U.K., in November 1978, and began his speech by citing Hirsch's dictum on controlled disintegration.

ment.

Immediately after Volcker had been appointed, I issued a widely circulated warning by my 1980 campaign for the Democratic Party's 1980 U.S. Presidential nomination. I warned, that if Volcker's just-announced policy were not immediately reversed, the result would be a very early collapse of the U.S. economy into a deep recession lasting several years. At the close of November, I issued another statement on this same subject, forecasting the eruption of a deep recession caused by Volcker Trilateral measures to begin by no later than February 1981.[45] From that time, through the close of 1983, my quarterly forecasts were, consistently, the most accurate provided by any source. To the present day, the U.S. economy has never recovered from the effects of Volcker's Trilateral actions.

Now, look at the combined effects of the Volcker measures, the Garn-St German and Kemp-Roth legislation, and the Carter deregulation binge, from the standpoint of what we have referenced here as feudalist ideologue Quesnay's pro-feudalist dogma. Do not look at these effects in isolation; but, rather, contrast these ruinous combined effects of Volcker's measures, Garn-St Germain and Kemp-Roth, with what I propose must be an integral part of the urgently needed economic recovery actions to be taken beginning the weeks immediately ahead of us.

To that purpose, focus for a moment on the narrowed implications of the issues posed by Garn-St Germain and Kemp-Roth.

There are two mutually exclusive notions of the way in which a modern agro-industrial society might generate what is called "profit." The first notion is developed from the standpoint of physical production, as U.S. Treasury Secretary Alexander Hamilton, for example, presents the case in his December 1791 Report to the U.S. Congress **On The Subject of Manufactures**. The opposing notion, which coincides with the "zero-growth" implications of Quesnay's feudalist doctrines of "bounty of nature" and *laissez-faire*, presents nominal "profit" as the apparent fruit of financial speculation, rather than production.

The principled difference between the two, mutually exclusive notions of "profit," is key to understanding the way in which the policies of the U.S. Carter Administration unleashed the process leading into the presently ongoing disintegration of the world's financial and monetary systems. Nothing promoted by Garn-St Germain or Kemp-Roth promoted physical-economic increase of productivity; that legislation was focussed upon increasing the rate of parasitical financier looting of both the U.S. Treasury and the U.S. economy otherwise, thus not only failing to promote growth, but actually forcing an increase in the rate of contraction, the rate of negative national-economic growth.

In the real world, profit from production or development of basic economic infrastructure is generated in the following way. A certain accumulation of valuable assets, as productive labor, infrastructure, or materials of production, is expended on the economy. As a result, a physical output is generated. In the happy case, the total output exceeds substantially the combined amount of labor, infrastructure, and materials of production used up in that cycle of production; this margin of increase of output over costs, is the gross profit of production. After deducting justifiable administrative and non-productive services outlays from that gross profit, an operating profit of society is defined, as the margin of useful labor and goods free, after costs of production, to be used in expanding or otherwise improving the economic process as a whole. In the U.S. economy, especially since Volcker, Garn-St Germain, and Kemp-Roth were turned loose, we don't do that old-fashioned good stuff much any more.

This brings us to the opposing notion of profit; an over-imaginative accountant's version of no-calorie, sweet-tasting, fresh-blown circus candy. It fills up visual space, but not your digestive processes. This was Garn-St Germain and Kemp-Roth. The so-called Quesnay-like, *laissez-faire* philosophy of Kemp-Roth is sufficient illustration of the point being made.

By cutting the capital-gains tax-rate, the rate of after-tax profits on purely parasitical, financial-speculative pursuit of financial capital gains zoomed, at the same time that the continuing after-effects of Carter Administration deregulation and Volcker measures were collapsing even existing levels of investment in useful goods. The effect of Kemp-Roth and related tax-boondoggles was to cause the rate of financial capital-gains to zoom, while accelerating the rate of collapse of investment in useful employment and production. As

45. My statement as a U.S. Democratic Presidential pre-candidate, in New Hampshire, October 16, 1979 (published in **Executive Intelligence Review**, Oct. 23-29, 1979, pp. 8-9); see also my specific forecast of the timing of the outbreak of the U.S. Volcker recession, November-December 1979. The latter forecast was based upon a computer-based projection of the LaRouche-Riemann Model.

these and related parasitical schemes piled the volume of nominal financial holdings higher and higher, the pressures of financial leverage escalated the demand for greater new volumes of the same type of purely speculative capital gains. Washington and the Federal Reserve System obliged; more and more liquidity was generated and pumped into such forms of financial speculation. Meanwhile, the new sums used to finance the growth of this financial-asset bubble were obtained by looting the wages, pensions, health insurance, educational systems, and so on, of the real people and real economy.

In these pathological and kindred monetarist policies, the object is not to generate a profitable margin of useful goods and services. The object is the creation of a marketable, although purely fictitious, financial capital gain. Part of this financial gain might be liquidated in the form of purchase of physical assets. The more significant ration is not so liquidated; that more significant ration is nominal financial gains generated out of "hot air," out of financial leverage. The launching of the "junk bond" swindle, and related leveraged "buy-outs" and looting of victim banks and other firms, that chiefly as a by-product of Garn-St Germain, is a prime example of this.

"Derivatives" are a much more extreme expression of the same sort of bubble-blowing, a "Pyramid Club" type of chain-letter financial scheme on an astronomical scale. Today, for example, there are more than $140 trillions of worthless paper, called "derivatives," and related "hedge fund" accounts, dominating the world's financial and monetary system. All of this is essentially a giant swindle. As the current Japan crisis illustrates this point: Either the governments intervene simply to cancel payments on the account of "derivatives" and kindred claims, or the world's entire financial and monetary system, and, the world economy with it, goes into a disintegration phase during the period immediately ahead of us now.

What we are going to do, if we are not insane, is, we are going to put the world's entire financial and monetary systems into government-supervised bankruptcy-reorganization. Most of the financial claims, such as the claims of a majority of Japan banks, are to be simply wiped off the world's books. Productive assets, honest savings of family households, and so forth, will be protected under rules of financial reorganization. Everything possible will be done, by responsible governments and cooperating private agencies, to ensure the continuity, and also the expansion of production of and world trade in agricultural and industrial goods. Pensions will be protected; the social fabric must be protected in this and related ways. Vast amounts of newly created credit, backed by governments, will be mobilized to bring the world economy, as rapidly as possible, above the physical-economic break-even point of physical-economic profitability.

How the Recovery Will Work

There is only one way in which we could avoid the disintegration of the entire world's financial, monetary, and economic systems during the course of the months immediately ahead. Since workable remedies taken in times of emergencies, such as the present world emergency, must rely as much as possible on tried and true examples from past experience, the measures which must be taken now, to prevent the collapse of this entire planet into a prolonged "new dark age," will be modelled, at least in large degree, on the measures projected by U.S. President Franklin Roosevelt for the post-World War II, global economic reconstruction.

This means, a protectionist form of global "Bretton Woods" conditions, modelled upon the most successful features of the pre-1959 period of post-war reconstruction. This will include the elimination of most of the so-called "globalization" measures adopted during the recent nearly thirty years of folly, and will feature pegged currency-rates, kindred pricing agreements on goods trade, and so on. This will include the wholesale write-off of the greatest amount of speculative forms of financial assets, writing off not less than $140 trillions of present claims on accounts of "derivatives" and similar financial trash, in order to save the useful and honorable part of the world's financial assets and obligations.

In the real world, such actions will be taken only if they occur under the most desperate conditions of clearly perceived global financial, monetary, and economic emergency. Such emergency actions will occur only if taken jointly, and suddenly, by an aggregately powerful concert of sovereign nation-state republics, probably led by the President of the U.S.A. Otherwise, if such action is not taken during those weeks and months immediately ahead, the world is going over the brink, directly into Hell, where it will remain for at least a generation or two. Those are your options; those are your only available choices.

If the required emergency action is taken, we shall reorganize a rapid expansion of investment in basic economic infrastructure, agriculture, and industry. This must be, and will be done, either on a global scale, or something close to that. The measures used to accomplish this will be modelled on the types of economic mobilizations which the U.S. launched during and following World War II. A combination of reasonable austerity, but net real growth in per-capita incomes and output, will prevail. Nations will cooperate to create the large-scale, long-term credit required to launch and sustain such a global expansion of the world's physical economy.

As I have indicated in other locations, the heart of a global economic-recovery program centers around the issuance of low-priced, long-term capital-improvements loans to nations such as China and India, to facilitate a boom in large-scale growth of machine-tool and other capital-goods exports from high-technology sources such as the U.S.A., Germany, Japan, and the revived machine-tool-design capabilities of the former Soviet scientific-military industrial complex. These would be loans with maturities from five to twenty-odd years, often featuring relevant grace periods, and issued at rates of between one and two percent per annum. Experience with successful growth of basic economic infrastructure and agro-industrial capacity, provides some important indications as to how such a new system of international lending would operate.

Before turning to our concluding topic, consider a few samples of those issues which such a recovery-program poses.

Long-term capital loans of these types are affected by three leading factors. First, the physical-economic "half-life"—e.g., physical depreciation—of the physical investment. Second, the relevant rates of what is termed "technological attrition:" as technological progress accelerates, the competitive productivity of capital improvements is used up more rapidly. Third, the characteristic rate of increase of the productive powers of labor, as measured in per-capita and per-square-kilometer terms. Given, a determined, required rate of physical-economic capital-intensity, and an associated rate of growth of physical-economic productivity per capita, a ceiling is defined for rational terms of repayments and borrowing charges.

Generally, economic history supports the following generalization. Unless we limit large-scale international lending to capital-intensive modes of increased (per-capita) physical-economic productivity, and hold prime rates of lending to between one and two percent on long-term, it is not possible to achieve the kind of global rates of real economic growth we require for pulling the world economy back from its present brink of global disintegration.

The U.S.A., China, India, and Russia

To make the case for emergency action clearer, consider the following summary of the course of action which should be launched jointly by the governments of the U.S.A., China, India, Russia, and other cooperating nations. Begin with a few of the most crucial strategic facts.

Presently, China's is the only relatively stable economy on this planet. This stability is the result of a relatively happy combination of circumstances.

First, China's recent relative successes and prospects, rest upon natural opportunities. China is presently the world's largest nation, situated, at the other extremity of the United States' historic direction of development of its economic relations, on the rim of the great natural channel for growth of world trade, the Pacific Ocean. It is the keystone national economy, among a group of nations in Asia which represent, in total, more than half the world's population, and, thus, all facts considered, represents the greatest potential for growth of the world's economy.

Second, during a period of approximately twenty years, China has astonished the sentient among its onlookers with the vigor and success of large-scale economic and social reforms. It is also the world's most stable society of the moment. It has developed a new stratum of leadership for its nation which reflects the experience and lessons learned in the process of achieving these relative successes. There are difficulties and dangers threatening China, but these are reflections of problems thrust upon China from other parts of the world, such as the October 1997 outbreak of a new round of global financial and monetary crises affecting the entirety of the world.

Third, China is situated as the presently leading nation of Asia, in a region which includes special resources on a vast scale. These resources include the very size of the Asia population itself, more than half the world's population. Otherwise, the most notable resources feature the potential for developing large-scale reconstruction of the water-resources of Asia, extending so to the Arctic and into the land-locked island of

An Indian peasant in Uttar Pradesh collects cow dung for fuel. "The development of the standard of living of the Asia population requires massive infusions of investment in basic economic infrastructure, plus high rates of infusions of technological advances in the productive powers of labor at the point of production and elsewhere. The ratios of per-capita capital- formation implied by such undertakings can not be endured within these parts of Asia, without high rates of technological progress."

the South Asia subcontinent.

Take the case of India, for purposes of comparison. The key problems of India are a worsening rate of extreme poverty within the majority of the population, especially since the assassinations of Prime Minister Indira Gandhi and her son Rajiv. Mrs. Gandhi was devoted to policies, and matching practices, which fostered improvements in the conditions of life of, notably, the rural poor. One of the former advantages and disadvantages of the leadership provided by Nehru and Indira Gandhi, is that that family personified India to a degree which has not been successfully replaced since the assassination of Rajiv.

The outstanding, historically determined problems of India's economy and political being today, are chiefly four. First, lack of development of the education of the poor, and under-utilization of the potential represented by the students and graduates of the scientific programs of its universities, especially of the Indian Institutes of Technology. Second, a failure to take on the urgent task of sub-continent-wide water management, a task often proposed for action by India's leaders, but a task which has never been effectively undertaken, because of blocking actions from within India's famous bureaucracy and other political impediments. Third, the failure to develop an adequate new power grid, freeing India from the disastrous effects of transporting poor-quality coal from North to South, and related circumstances. Fourth, the failure to lift India out of the effects of the decay of a rail system virtually unimproved since independence.

Although the situation in China is significantly different, the same four kinds of needs for educational and infrastructural development, are the commonly most urgent characteristics of all East, Southeast, South, and Central Asia.

There is a fifth crucial problem characteristic of this entire region within Asia. The possibility for raising the standard of living of the population of Asia in general, as in the case of goals adopted by the government of China, requires the formation of social capital, especially for development of infrastructure, on a vast scale.

The development of the standard of living of the Asia population requires massive infusions of investment in basic economic infrastructure, plus high rates of infusions of technological advances in the productive powers of labor at the point of production and elsewhere. The ratios of per-capita capital-formation implied by such undertakings can not be endured within these parts of Asia, without high rates of technological progress. Economies are able to afford high rates of social formation of productive and related capital, only when the cost of replacement of such capital is being greatly reduced by relatively high rates of technological progress.

For those among us familiar with the areas of East, Southeast, and South Asia apart from the special case of

Japan, the outstanding obstacle to improvement of the conditions of life throughout Asia as a whole, is the lack of adequate machine-tool-design capacity on the ground within the territory of these nations. The increase of the number of advanced science-graduates from qualified universities, which must be coupled with high rates of progress in those graduates' participation in crucial experimental proof-of-principle developments in technology, is the great technological bottleneck which must be overcome if the social goals of development for Asia are finally to be realized.

This latter challenge defines the need for a special new kind of partnership between these countries of Asia and the traditionally more advanced economies of the U.S.A., Germany, Japan, and so forth. In that new global division of labor required as part of a planet-wide economic reconstruction-program, those nations which used to be the traditional machine-tool-design-exporting economies of the world, must revive and greatly expand this role. Their function must be, not only to deliver greatly expanded machine-tool-design capability to the nations of Asia; they must also assist in building up a much-needed machine-tool production and service capability, in depth, within these economies of Asia.

To illustrate the point, consider the role of Japan in this. The tragedy of Japan, was the exemplary role of Henry A. "Tweedledee" Kissinger and Zbigniew "Tweedledum" Brzezinski, in shutting down Japan's efforts to provide countries such as Iran and Mexico, oil-for-technology and kindred trading agreements by means of which to aid in transforming so-called "developing nations" into modern economies living in political parity with the United States and western Europe. Japan was pushed by such creatures as the pair of Tweedledee and Tweedledum, into shifting out of a high-technology, heavy-industry, capital-goods-export orientation into developing nations, into dumping consumer products, cannibalistically, into the markets of North America and western Europe. Now, Japan must exactly reverse the trend forced upon it beginning the 1970s, to return to a heavy-industry, machine-tool-design export orientation, to function as the leading machine-tool economy of the Asia side of the Pacific rim.

Japan must scrap the worthless financial capital which is suffocating it today, to convert its salvageable debt into elements of a mechanism of credit to be used for a return to the technology and export orientations of the happier days before Kissinger and Brzezinski.

The U.S.A. and western Europe, the latter led by Germany, must make the same kind of reversal of recent trends in economic policy.

These stated requirements for cooperation among the nations identified, must also take into account the urgency of stabilizing Central Asia, of ridding that region of the currently ongoing efforts of British and other elements of influence to revive the "Great Game" of the Nineteenth Century. The resources for assisting Central Asia in finding such stability are presently concentrated chiefly in China, India, and Russia. Cooperation with the latter three nations, and other nations of the region, must be supplied from the U.S.A., Western Europe, and so on, but cooperation can not be supplied efficiently without a leading role by cooperation among the three named, leading nations of Eurasia today.

Russia figures in this equation in another, related, but distinct way.

The only possibility for the economic revival of Russia lies in the role to be played by the most advanced ration of Russia's combined present and former labor-force, notably the scientific-military-industrial complex developed within the former Soviet Union. For Russia's economy itself, the problem is, that without reactivating that complex as the basis for an export-oriented, vast machine-tool-design complex, there is no possibility of halting the presently accelerating plunge of Russia and adjoining former members of the Soviet Union into a strategically world-perilous form of disintegration. The potential markets represented by the indicated prospects for economic reconstruction of Asia represent the margin of opportunity without which Russia could not be brought to economic and financial stability.

The combination of large-scale infrastructure development in Eurasia (in particular), with the global role of a rapidly expanding machine-tool-design sector, is the strategic key to the prospects for survival of civilization at this time, a prospect which demands a quality of thinking about economics directly opposite to the trends which have taken over, increasingly, in the U.S.A. and elsewhere, during the recent thirty-odd years.

Contrast to such prospects for Eurasia, the case of the effects of the measures introduced, beginning October 1979, by Federal Reserve Chairman Paul Volcker. By skyrocketting prevailing interest-rates to a super-usurious rate of eighteen percent per annum, and even higher, Volcker did exactly what he and the Trilateral Commission had promised to do: to subject the U.S.A.'s and world's economies to a process of "controlled disintegration."

The recent pattern in "IMF conditionalities" is the same lunacy expressed by Volcker's actions of 1979-1982. To slash investment in basic economic infrastructure and productive capital, while elevating borrowing costs to levels of usury, has precisely the same kind of predictable effect as Volcker's measures of 1979: controlled disintegration of any economy unlucky enough to have the gun of "IMF conditionalities" stuck against its head. Worst of all, is the implicitly criminal practice of subjecting national economies to floating exchange-rates, while, at the same time, placing control over the prices of currencies and loans in international markets at the discretion of financial speculators such as George Soros. No sane authority would do as the IMF has done repeatedly. No sane government, or banking agency, would propose to reform a sickened economy by driving its levels of productive output way below the physical-economic break-even point, in the name of "austerity." Directly the opposite course of action is mandatory.

To restate, in summary, the proposition outlined above: Any sane government does as U.S. President Franklin Roosevelt did, when he attacked the challenges of both the 1930s Depression and the World War II mobilization. One quickly writes off bad debts not worth salvaging, such as the perhaps $2 trillions of the worthless paper cramming bankrupt Japan banks; at the same time, one uses the sovereign power of government to create masses of very low-cost, long-term credit, concentrating that newly mobilized credit into investments in basic economic infrastructure, increased employment in combined agricultural, construction, and industrial operatives' work-places, into expanded physical output, and into higher levels of technology employed.

This is the gist of the new directions we must take, if this nation, and civilization generally, are to outlive the end of President Bill Clinton's present term in office.

What Matters in Economics

The deeper issue, which we have promised to address, has a twofold character. First, to account for the axiomatic root of the incompetence respecting economics, as represented by Wall Street and like-minded institutions today, we must address the phenomenon of the oligarchical mentality as a type. Second, we must show how the axiomatic implications of that oligarchical mentality as such, coincide with, and explain the coincidence between the linear mathematical ideology of the empiricists such as Hobbes, Locke, Smith, Bentham, et al., and the refusal of the pro-oligarchical ideologue to recognize that it is mankind's physical relationship to nature, rather than financial relations, which determine the ultimate outcome of economic systems. When these connections are recognized, the reasons Wall Street and other relevant circles behave as irrationally as they do, are more readily understood.

Take these connections in the following order. Begin by reporting on one crucial implication of the nominalist method which we have not addressed up to this point: why and how the nominalists (reductionists) refuse to acknowledge the physical implications of their own formalism. Show that implication, by focussing upon the mathematical meaning which we should associate with the term "physical." From that point, turn attention to the fact that the ordering of physical-economic processes is a willful form of functional relationship between man and the physical universe, between the human species and that universe.

Proceed by reporting that the way in which the term "non-linear" is generally used among today's mathematicians and physical scientists, is a slovenly practice. It has become, so, in those mouths, one of those kinds of terms which pretends to mean something precise, and yet, on closer inspection of that speaker's head, means virtually nothing. What it ought to signify, is that Enlightenment ideologues such as Leonhard Euler and Augustin Cauchy are babbling nonsense. The reality to which a meaningful use of the term "non-linear" ought to refer, is a reality which the fellow-ideologues of Newton, Euler, Cauchy, et al. have refused to admit exists. That reality is simply the non-existence of linearity in respect to any matter expressing the distinctive characteristic of any physical process in the infinitesimally small. It is a view of such characteristics from the standpoint of the Kepler-Leibniz-Gauss-Riemann conception of a multiply-connected physical-space-time manifold.

In that occurrence, "non-linear" signifies what Leibniz and Gauss indicated it to signify: that characteristic of a physical process which is expressed in the smallest infinitesimal interval of action of that process. In real physics, as opposed to the aberrant sentimentalities of the philosophical materialists, empiricists, and so on, matter is not defined as the durable objects seen at the extremity opposite to sense-perception. To repeat the crucial point: In physics, what we signify by a physical process, is that kind of characteristic which appears in the form of a characteristic expressed as a non-constant curvature in the infinitesimally small interval of action within a multiply-connected manifold. That characteristic is the only meaningful phenomenon of the quality of being a "physical" type, which science presently knows.

To the extent that we should be permitted to say "we know" anything about such physical processes, we know the physical realm only to the degree we are able to supply crucial experimental demonstrations of discovered physical principles, that we are able to willfully change a physical process in this willful way. Thus, "physics" should be limited in meaning, to signifying that we are able to change the human species' relationship to the universe through validated discoveries of principles. We are thus able to change the way in which the physical universe behaves, by introducing the efficient action of a newly discovered, validated principle. We are thus, in that manner, and in that degree, able to bend the universe's physical characteristics to our will.

The test of that relationship, is mankind's manifest power to increase our species' potential relative population-density in this way.

In all such connections between man and the universe as a whole, the changes effected originate in a process of the sovereign individual human mind, the process of cognition which Immanuel Kant, for example, denied to exist. This process, through which ontological paradoxes are transformed into discoveries of validatable newly discovered physical (for example) principles, is the mode of physical action by means of which mankind is able to introduce successful, willful changes in the characteristic behavior of those physical processes upon which we act.

Without that efficient connection between cognition and the physical processes of the economy as an integrated process, there is no economics. Every result depends upon that connection.

This now tells us a great deal about the deranged mind of the monetarist. The typical monetarist assumption, that interactions between financial magnitudes determine the performance of economies, is clearly a delusion. The efficient, actual relationship underlying any real economy, is located in the physical actuality of the process, not the financial price-tags attached to the physical realities. The function of prices is no more than an administrative act, the intervention into the physical-economic process with a decision about allocation. The only lawful consequence of financial relations, is the impact of the changes in physical allocations consequent upon the ordering of financial relations. It is solely within the physical-economic side of the process that the consequences of allocation-decision are determined. Monetarist theory is therefore lunacy, often a dangerous form of lunacy.

There is no intrinsic right or wrong about prices; the right or wrong of the matter is located entirely in the consequences of the physical-economic action as such. It is solely within the lawfulness of the physical-economic process, that the right or wrong about prices is determined.

For example, the general policy of a sane republic, is that forms of economic activity which are both desirable and well performed should be profitable to those who undertake them on behalf of society.

A sane society regulates general freight-rates, for example, to ensure the competitiveness of every community of the nation which we intend should be competitive. The awful consequences of deregulation of freight, show, therefore, that deregulation is morally wrong. The disastrous effects of our national experience with deregulation, since 1980, have clearly proven, that the ranter who insists that deregulation will bring the eternal blessings of "free trade" to the delivery of freight, is either a malicious person, or a blundering idiot not to be let out of the house without a keeper.

There is no general principle of prices, other than the general principle I have just illustrated. A sane society formulates rules, affecting prices, taxation, tariffs, and so forth, to the purpose of producing a nationally desired physical-economic effect. These formulations, which shape the markets within which public and private enterprises operate, become the rules of the game by which enterprises and their customers play. It is the importance of having government intervene, from time to time, to arrange a lawful set of such rules appropriate to changed circumstances, which goes directly to the morality of such rules and their observance. There is no monetarist's or kindred general theory which is capable of providing a sane alternative to this approach to such matters affecting pricing policy.

Now, that much said thus far, it is now time for us to focus upon the issues embedded in the nominalist's ideologically-motivated reliance upon linearity in the infinitesimally small.

The application of assumption of linearity in the small to the representation of economic processes, signifies that that type of economic thinking permits no consideration of the physical reality underlying the economic process referenced. Without attention to the distinguishing characteristics of the physical processes, the fact of existence of physical processes is excluded axiomatically from any serious consideration. It is the interaction between the physical characteristic of cognition and the physical characteristics of the processes into which cognition intervenes, which is the essential feature of economy. For the deranged mind of the monetarist, none of these determining features of the process exists.

If one replaces the "non-linear" characteristic of a physical process by the assumption of linearity in the infinitesimally small, what has become of the physical process's representation in that view of the matter? In such a case, that such linearity is imposed axiomatically, "physical" does not exist in the mind of those engaged in the relevant deliberations. It is the specific form of non-constant curvature in the smallest interval of an action within a multiply-connected manifold, which defines the efficient reality of "physical." Without that, "physical" does not exist within the intellectual schema brought to bear.

Furthermore, as we have already stressed this point, the act of knowing the physical reality which is the subject of human willful intervention, flows only from the role of cognition. Without the intervention of cognition, there is no efficient knowing, and therefore no known ordering of the development of the physical-economic process. Without cognition, there is no action combining the conditions of economy and human activity on those conditions. Cognition, expressed in respect to the non-linear characteristics of relevant physical processes, is the economy.

This brings us, now, to the culminating topic of this report, the matter of the fictional relations between oligarchs and human cattle in Wall Street's view of the universe. This brings us back to the subject of Quesnay.

'Pray, Sir, and Whose Dog Are You?'

The key to the present world financial and monetary crisis, is the post-Roosevelt revival and increase of the power of the oldest evil known to human history, *oligarchy*. The general way in which this recent resurgence of global oligarchical power occurred, is sufficiently outlined, for our present purposes, in my July 17 "Where Franklin Roosevelt Was Interrupted."[46] It is sufficient for our purposes here, to illustrate the meaning of the "oligarchy" for today's subject, by referencing the post-war British-American-Canadian cabal set up beginning 1938, as identified in my recent "The Eagle Star Syndrome."[47]

In relevant history, since the time of the self-doomed Akkadians, oligarchy has existed in three principal types: landed aristocracy, financier oligarchy, and a state-bureaucratic oligarchical caste. Throughout history, such oligarchies dominated society until the Fifteenth-Century Golden Renaissance launched those beginnings of the modern sovereign nation-state leading into the 1789 establishment of our own U.S. Federal constitutional Republic. The general character of all oligarchies, is that they regard themselves as a landlord class ruling over another ninety-five percent or more of the population, whom the oligarchs breed, cull, rear, and herd, as they do wild game or cattle, and as the Confederacy's slave-owning oligarchy captured, reared, herded, culled, and killed, its African and African-American slaves.

What has variously crawled, crept, and slithered into "Wall Street"-centered, Anglo-American tyranny over the U.S. and its economy, is a financier-oligarchy of the Venetian type, an oligarchy which deploys as its principal ally and instrument, an out-of-control, treasonous, tyrannical, bureaucratic monster centered in the Criminal Division of the Department of Justice. This oligarchy regards itself as the relevant landlord, and has relegated about ninety-five percent of the population as a whole to assume the destiny of looted and virtually enslaved human cattle. That is the sociological essence of the current situation in Wall Street, on Main Street, and in our nation's Capital. That oligarchical mentality, as contrasted with U.S. political standards prior to 1964, is the mentality behind the August 1971 set-up of the "floating exchange-rate monetary system," the 1976-1992 depredations of the Trilateral Commission's control of the Presidency, and the current binge of so-called "globalization."

The characteristic of all oligarchical thinking, is the attitude of a landlord (or, his estate-manager lackey) to the human cattle he deems the overwhelming majority

46. op cit.

47. **Executive Intelligence Review**, August 7, 1998.

of the population to be. He does not accept the notion of any human being as being actually human, as being a creative being made in the image of the Creator (by virtue of efficient cognition). To admit that the durable existence of economy depends upon the efficient role of individual cognition, would define the oligarch and his lackey themselves as Solon of Athens saw such oligarchs, as parasites better expelled to Eleusis.

Thus, it is the system of administration in terms of prices, as viewed in the linear terms of reference of the financial accountant, which becomes the disgusting misconception of "economics" shared among the oligarch and that accountant.

Consider the simplest of the implications of the distinction we have made. If the physical costs of basic economic infrastructure, household standard of living, and so on, are the necessary preconditions for maintaining an economy's stabilizing rate of growth, then those costs can not be cut for the purpose of maintaining some rate of financial profit. In such cases, the financial interest must give way to the human interest. Economy says to the financial ownership, and to the accountant, "If you wish to have a satisfactory rate of return on investments, to which we have no objection, then you must obey the rules governing this. You must make the investments, must establish and maintain the priorities, which are preconditions for realizing physical-economic anti-entropy for the society as a whole. If you, as ownership, refuse to meet those conditions, then it is you who should suffer the penalty caused by your immoral lack of responsible behavior."

The oligarch does not receive such communications kindly. "Cut health-insurance payments; our profits demand it. Cut welfare; our profits demand it. Introduce privatized slave-labor as prison policy; our profits demand it. Cut out the expense of useless eaters, as Hitler did; our profits demand it." If the maintaining of the level of output requires that we educate our population to levels at which technological progress may be continued, the oligarch slaps his palm down hard on the table-top: "No. History has shown, that whenever ordinary people become intelligent through exposure to the kinds of knowledge scientific and technological progress implies, ordinary people tend to become much too intelligent for our comfort; they tend to insist that all the relics of oligarchical rule be eliminated. That, we, like Henry A. Kissinger, and Clement Prince Metternich before Kissinger, will never tolerate. Crush them!"

As we see in the disgusting public behavior of the ruling family of Monaco, England's degenerate Prince Philip, and similar types of parasites, the oligarchical personality-type converges upon outright enmity toward any suggestion that society ought to be arranged in terms consistent with the fact that man and woman are made in the image of the Creator. That image of man, as man in the image of the Creator, becomes for the oligarch the most hated idea. The idea of cognition

Math and Matter

August 5, 1998

The accompanying report features three included conceptions which most students of mathematics and mathematical-physics subjects will find extremely disturbing, even perhaps violently so: 1) the notion of a negative form of mathematical definition of "matter;" 2) the notion of a physical characteristic of the action of human cognition, also negatively defined; 3) the notion of a functional interconnection between the two, also negatively defined. What I have said on those matters stands on the basis of the evidence which I have indicated either in that report, or in related, referenced other locations. All that need be done here, in this attached memorandum, is to soften the intellectual blows I have delivered on these accounts. To that purpose, I call attention to what ought to be any literate person's familiarity with certain arguments by Leibniz.

In this connection, it should be stated once again, that the kernel of all my fundamental contributions to a science of physical economy, is repesented by five essential conceptions, of which three are elaborations of concepts which I first adopted, during my adolescence, from study of some of the writings of Gottfried Leibniz, and another I adopted later, in 1952, chiefly from the work of Bernhard Riemann. The fifth conception, the notion of a characteristic economic principle of oligarchism, I developed separately, during the 1950s, from my study of the physical-economic roots of the recurring degeneration common to both the Roman Empire and all among itself, becomes the most hated idea. The idea, that through the characteristic of action represented by the sovereign powers of individual cognition, mankind is able to act willfully upon the characteristics of physical processes as such, becomes a most hated idea. In place of the real universe, the oligarch insists upon a realm in which the caprices of Zeus's Olympian oligarchy deal with every matter by no other means than the whims of simple oligarchical modes of administration.

Thus, for the oligarchical bureaucracy of the present Criminal Division of the U.S. Department of Justice, there is no truth, no justice; there is only the matter of administering society to effects deemed agreeable by the oligarchs of Wall Street and kindred parasites.

the known pre-Hellenistic cultures of Mesopotamia.[1]

For the purpose of identifying the original prompting on those topics which the reader of the accompanying report might find most disturbing, the subject-matters of matter, cognition, and the functional relationship between the two, my relevant adolescent readings from Leibniz were English translations of his **Theodicy**, the Leibniz-Clarke-Newton correspondence, and the writing posthumously published as **The Monadology**. The included aspect of Leibniz's work on which I put emphasis here, is his extensive attention to the problems posed under under such rubrics as "clear and distinct ideas."

The central feature of those original discoveries which I developed toward the beginning of the 1950s, was my method for representing actual anti-entropy, as opposed to Professor Norbert Wiener's fraudulent, reductionist notion of "negative entropy."[2] My solution to the problem was to pose anti-entropy in physical-economic terms; the solution was my now familiar, paradoxical form of simultaneous inequalities. Similarly, my defining the sovereign individual act of cognition, in opposition to Immanuel Kant's denial of cognition's existence, relies upon use of a paradoxical formulation of a type related to that used to depict anti-entropy. It should be obvious to one familiar with Leibniz's work, that both of these discoveries of mine from that period, echoed Leibniz's notion of a *monadology*, and still do today.

My choice of these two paradoxical forms of expression, for anti-entropy and cognition, respectively, was prompted by my attention to the relevance of the Classical definition of *metaphor* in poetry and drama. My argument during the late 1940s and early 1950s was, and remains, that that act of cognition which is responsible for generating a crucial validation of a newly discovered principle of experimental physical science, is of the same type of act of cognition as that which generates a valid solution to a Classical artistic paradox in poetry, drama, or music.

On the basis of my pre-1952 elaboration of these conceptions respecting anti-entropy, cognition, and Classical art, in 1952 I came to recognize a related implication in Bernard Riemann's 1854 habilitation dissertation.

It followed, from that combination of discoveries, up through 1952, that I adopted the notion of functional anti-entropy as the basis for any valid notion of efficient physical existence. The correlated notion, is the fact that the effectiveness of progress in validated discoveries of physical principle is shown, as a matter of crucial-experimental proof, to be a form of physical action upon the multiply-connected manifold which is the domain of what we call "matter."

Against such evidence, the reductionists have no argument but either lying, an outburst of hysterics, or, a combination of both. As the once-famous Dale Carnegie et al. suggested, the road to success as a salesman or conniving back-stabber in the corporate rat-race, is to learn how to lie a lot while wearing a smile on your face. The heart of the matter is: Mastering the challenge posed by the issue of clear and distinct ideas, is not easy; for reductionists, such mastery is impossible.

—Lyndon H. LaRouche, Jr.

1. One of the products of that study of oligarchism was circulated privately, in 1962, under the title of **The Origin of Caste**. This reflected my attention to the functional roots of oligarchic bureaucratic caste-formations in such diverse expressions as the ancient Mesopotamia priest-castes, the Roman imperial bureaucracy, the corporate bureaucratic phenomenon of the U.S.A. during the 1950s and early 1960s, and related caste-formations in socialist organizations. The Criminal Division of the U.S. Department of Justice today, is typical of an oligarchic bureaucracy.

2. After years of quarrelling with reductionists over what the term "negative entropy" ought to be signified to mean, I found it simpler to use the term "anti-entropy" instead.