
A New Paradigm: The Thernonuclear Future

Benjamin Deniston gave this [speech](#)¹ to the Schiller Institute's conference, "A New Paradigm To Save Mankind," on Nov. 2 in Los Angeles, Calif., on the panel, "The Legacy and Future of JFK."

I think the challenge for us, here today, and the challenge that mankind is culturally facing more generally—but what I would say is a personal challenge for us—is to not situate ourselves in the here and now, not to think about our existence, our identity from the standpoint of our mere, day-to-day interactions with people around us. I would propose that at the minimum, we have two 50-year processes that we should be thinking about, and we should identify ourselves from the standpoint of our relationship to and our contribution to two juxtaposed 50-year processes. And that these are actually more real and more determining than anything you experience on a day-to-day basis.

Now, first, as we've discussed, we're approaching the 50-year anniversary of the assassination of John F. Kennedy, marking the beginning of a major decline in the United States, a political coup against the United States, the beginning of a political shift towards a zero-growth paradigm, the abandonment



EIRNS/Stuart Lewis

Benjamin Deniston (shown here at an earlier conference): If the United States is going to commit to the future, we must ally with nations that want to move forward, first and foremost with fusion power, the development of a fusion economy.

of the idea of progress, the control of the United States by this Anglo-Dutch imperial system. And under this paradigm, over the past 40-plus years, there has been no per-capita growth, no per-capita improvement in the conditions of life in the United States. And now, we're at the point where that entire framework is collapsing under its own failure.

Secondly, in opposition to that, we have an opposing conception of a 50-year process looking two generations into the future, and thinking that if the United States is going to commit to the future, and if mankind as a whole is going to progress to the needed levels, we must begin looking to regions of the planet, and nations of the planet, and peo-

ples of the planet that want to progress, that want to develop, that want to move forward. And we must understand the tools that will enable the type of progress needed.

So that means, first and foremost, thernonuclear fusion power, the development of a true fusion economy for mankind. And secondly, as has been discussed, this means an alliance across the Pacific stretching deep into

1. All conference presentations are available at <http://newparadigm.schillerinstitute.com/>.

FIGURE 1
The World Land-Bridge



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Asia, where we have nations that want to grow, nations that want to progress, and nations that would be happy to ally with a United States committed to this mission.

What will this look like? We have this detailed in our *21st Century Science & Technology Special Report, Nuclear NAWAPA XXI: Gateway to the Fusion Economy*; this is, as Lyndon LaRouche has described, the concept of development stretching from the Mississippi River in the United States, west and north with the entire NAWAPA [North American Water and Power Alliance] program; and as Hal Cooper discussed, through the Bering Strait connection, with tunnels connecting North America and Asia; the prospect for the development of the entire Arctic territory, rich in a whole array of resources; and stretching down into Russia, China, South Korea, Japan, places where we have potential allies in this future orientation; and as the new President of China has discussed, with the New Silk Road stretching west and southwest into Asia.

This program, this Pacific orientation, this Pacific development prospective, can create the political, strategic dynamic in the world as well as the physical economic growth, the rate of growth needed to actually extend this development further throughout the world (Figure 1), throughout Europe, throughout Africa and South America, completing what has been discussed here, as envisioned and promoted by Lyndon LaRouche and

Helga Zepp-LaRouche, the World Land-Bridge concept, providing mankind with the basic conditions of life globally, that the dignity of mankind deserves as a creative species.

So this is what we have as two juxtaposed 50-year processes.

What Does It Mean To Be Human?

I want to step back and situate this from the standpoint of a more fundamental question, something that Mr. LaRouche spends a lot of his time addressing, investigating, discussing from a scientific

standpoint, which is the fundamental question of what is the human species? What is the nature of mankind, and what is the mission of mankind on this planet, in this Solar System, in this universe? Or, to investigate it in a more pedagogical manner, to illustrate the point: What is the difference between mankind and the species of higher apes, of animals, of monkeys?

So this is a way to get at the point (Figure 2): Any animal species, say, one of the higher apes, has a biologically and ecologically imposed upper limit on its population levels. For higher apes, maybe in the range of a few hundred thousand to a few million people, globally, depending on the conditions available to them. But no animal species itself can act to change this. Spe-

FIGURE 2
Population Potential of Higher Apes

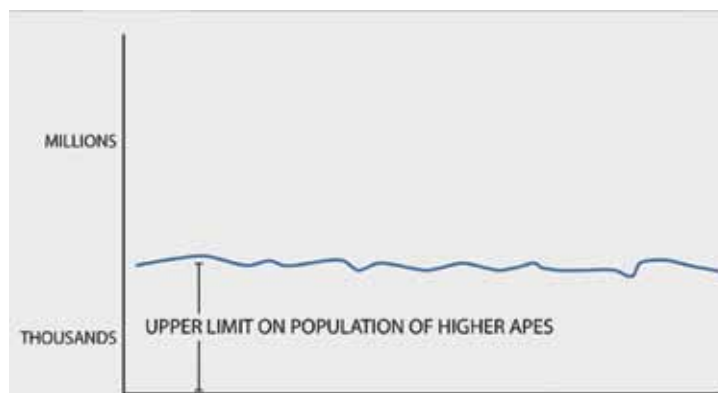
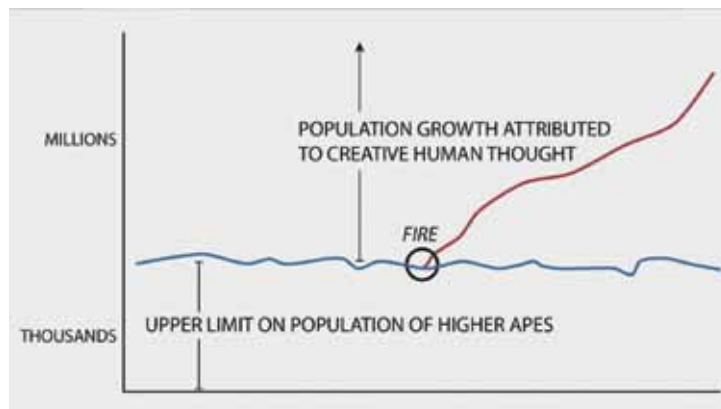


FIGURE 3



cies evolve over time, but they create new species. Species will change their relationship to the biosphere, through biological evolution, but no species other than mankind has the ability to willfully act on its relationship to the environment. They have an imposed, fixed condition, which you can measure clearly in the maximum population levels.

But as Mr. LaRouche discussed earlier this morning, at some point in the past history of the Earth, we see evidence of something fundamentally different. We see evidence of the conscious use of fire. This was not just making a fire, but wielding the power of fire for the betterment of the conditions of mankind, for cooking food, using the power of fire for making tools, using the power of fire for work. As a consequence of this, of this new ability to consciously wield this power, mankind forever effectively changed what we would otherwise call its ecological conditions, the relationship of mankind to the environment around him.

And so what we have is really, the introduction of thought of ideas, of creative thought as a force on the planet (**Figure 3**). And you can measure that in its physical effects with the increased population growth of what became the human species. As you can see here, it's a scientific fact that everything above this maximum biological potential is purely attributed to the power of scientific thought. Everything above the maximum population level of a higher ape is attributable to the effect of man's use of "fire," which is a consequence of man's ability to wield ideas, concepts, scientific discoveries, which then have a demonstrable physical effect in the universe, on the Earth in this case, on the population levels.

Another way to put it, to be a little more polemical with the concept we're contemplating here, is that the mental actions, the actions of the minds of individuals,

become actually the fundamental source for the existence and the conditions of life of future generations. That for the first time, it's the power of thought, of mind, that actually has these physical effects.

This unique power of mankind, as Mr. LaRouche as discussed and developed in his science of physical economics, can be measured by transitions to higher forms of fire, higher qualities of fire. What can be measured is the energy per individual of society, the power expressed per capita, per individual in society. I think it's useful to compare it to the biology, to really solidify this distinction in your mind between the biological existence of an animal species and what makes mankind unique.

The human body requires a diet of something on the order of 2,000 calories a day; that's how much energy on average is required to sustain the human body, the human biology. Now, if you want to translate this into what gets discussed in energy terms, this is about 100 watts of power, the amount of electricity required to power a 100-watt light bulb, for example. It obviously doesn't reduce down to that, but for comparison's sake, that's the idea of just the biological energy required to support the human body.

But with the development of mankind's ability to wield and control fire, to change its fundamental relationship to the environment around us, we see that the average power controlled and utilized per individual increases, and this defines the successive transformations of the human species.

Power per Capita

A good illustration of this is from the history of the United States. If we examine the changing power per capita (**Figure 4**), from the founding of our country up until 1970, we get a clear sequence of transitions to higher forms of fire, higher-power sources. This energy use per capita, this power per capita, is not just how much energy you use in your home! We are discussing this in a post-industrial society, so if we talk about increasing the energy per capita, people think, "Will I need four TVs instead of two? Will I need six microwaves instead of one?" This is the average power that goes to support all activities of society, then broken down into per-individual terms: all the power, all the energy applied for all agriculture, all industrial activity, all mining activity, all the power used to transport all the goods.

So, the history of the United States, just pulling up the data, shows us very clearly: You have a sequence of tran-

FIGURE 4
U.S. Power Per Capita

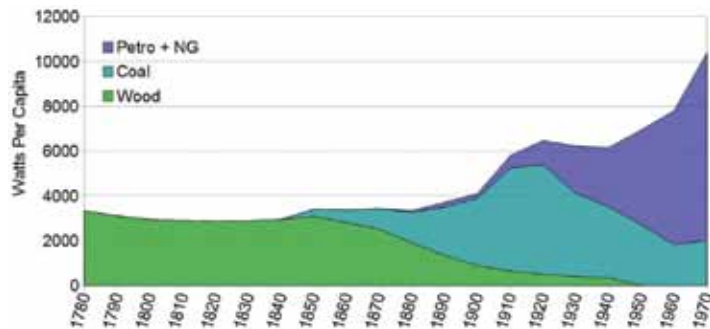
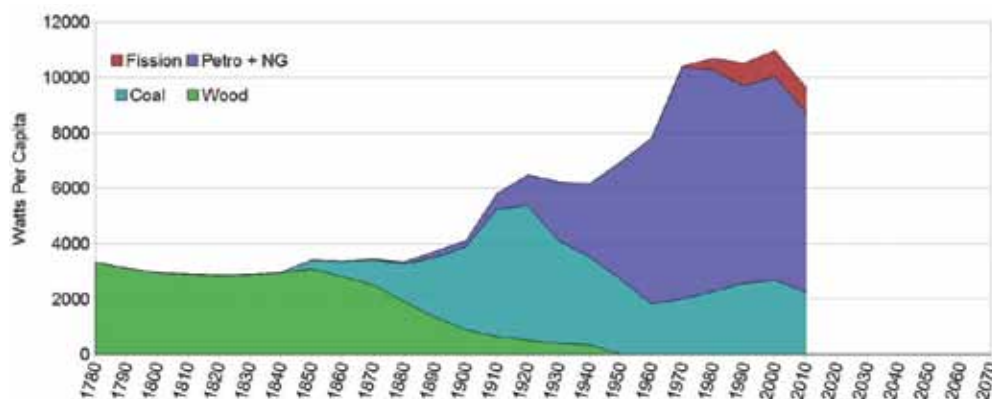


FIGURE 5
U.S. Power Per Capita



sitions from the founding of the United States until some time around the Civil War, when you had a predominantly wood-fuel-based society. The vast majority of the power used for all aspects of the economic process was supplied by burning wood; and this peaked at an average of somewhere around 3,500 watts per capita. Now, these terms might not mean much; the point is the relative values. The point is, this is 35 times the power supply just to support a purely biological existence. The human body itself requires maybe around 100 watts to sustain it. Here we have, as a wood-fuel-based society, an economic process where you're at about 35 times that energy consumption per capita, to sustain this level of society.

Now, with the development of a coal-based economy, with the higher energy-densities available in coal and coke, you had an economic shift, which enabled entirely new technologies: You had the development of steel production on a large scale; you had the development of railroads enabled by this higher-energy-density power source. You had the beginnings of the second industrial revolution. You had, really, a new economy, fundamentally different from the one that preceded,

based upon wood, a qualitative shift. And to enable this shift required an energy-density per capita approaching around 6,000 watts per capita. So again, the point is just to compare the relative increases, the relative values.

And this then enabled the transition to a fundamentally new level, with the higher energy-density petroleum and natural gas, enabling an entirely new set of technologies, a new economy, things like the internal combustion engine, and this brought us up to about a level of 10-11,000 watts per capita. So by 1970, the U.S. economy was supported by about

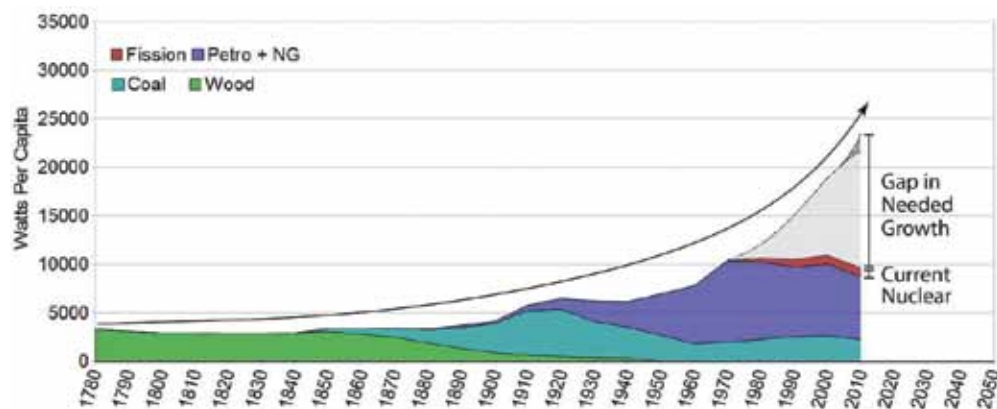
100 times the energy use per capita, if you compared it to a purely biological existence.

The point is, this is a healthy economic process, a series of transitions to qualitatively higher states, powered by scientific discoveries as expressed in the increase in power per individual in society. This expresses what is natural to the human species.

This then brings us back to the first of our opposing 50-year processes (Figure 5). At this point, around 1970, you had the beginning the zero-growth ideology. And what should have come in as the new major power source supporting mankind, nuclear fission power, the power of the atom itself, something thousands of times more powerful, more energy-dense than any form of chemical combustion, was never allowed to fully develop. It was never allowed to actually come into the economy as a major transition. And as you see here, the energy per capita, the power of the economy per individual, flat-lines—levels off—and begins to collapse for the past 40 years.

If we had continued a healthy, natural economic process, it should have looked something like this (Figure 6). Nuclear power should have brought us something in the range of 20-30,000 watts per capita, somewhere two to three times what we had 40 years ago. But what you see in this gap between the two curves, the gap between where we should have been and where we currently are today, is a very clear expression of our current economic crisis: The collapse in

FIGURE 6
U.S. Power Per Capita



living standards, the challenge to entitlement programs, the fact that younger generations are facing the prospect of being worse off than their parents' generation; the failure to grow, the failure to make this leap, is really the root cause of the current economic breakdown.

Sabotage of Fusion Research

Now, just as nuclear fission was never allowed to develop, the next transition, thermonuclear fusion, which I'm going to get into in more detail, was suppressed. It was never allowed to develop.

Mr. LaRouche talked about this this morning; there's a lot that can be said about this, but I think one way to illustrate the point, is to look at the funding (Figure 7). Because the line is, "Fusion is, today, 50 years away; and in 50 years it'll be 50 years away." That's the kind of joke going around—it's always 50 years away, it's never going to happen.

But if you get into the reality of the simple funding of it, in the 1970s—this comes from an official study commissioned by the equivalent of the Department of Energy, at the time in the mid-'70s, and this was the first comprehensive, detailed analysis of what it would take to get fusion power on-line, commercialized, active in the economy. And they came to the conclusion, that given the recent breakthroughs that had occurred at Princeton and other places, that it's really just a question of supporting a certain sequence of steps that are clear. They knew which reactors to build next, they knew what experimental systems were needed, and it became a pretty clear question of: How much funding are you going to provide to take these steps to get us there?

And so they gave a range of investment options. You

can see, here, if we took what they described as a "moderate path" of funding—this is billions of dollars per year in 2012 dollars, ranging between \$1 and \$3 billion a year for various years—we would have had fusion on-line by 2005, they estimated. If we took a more ambitious program—still not something compared to, say, the Manhattan Project, or other crash programs—we could have had fusion on-

line by 1990. This was the conclusion of this official government study.

They also said, if we just maintain a certain low level of funding, we might never make the breakthrough and we might never get fusion. Say we just maintain the funding level from 1978, this might be "fusion never": We might not be able to make the breakthrough to get fusion power.

Figure 8 shows the actual funding.

This was a conscious policy, and this was known in the 1970s. It was known what level of investments were needed; they were simply not provided.

So to say that fusion power is 50 years away, is foolish or, for the most part, just ignorance of what the issue is.

And there are other details of the process: There are scientists who are losing their funding for being successful in fusion; there are technologies being classi-

FIGURE 7
U.S. Annual Fusion Budget Scenarios
 (\$2012 Billions)

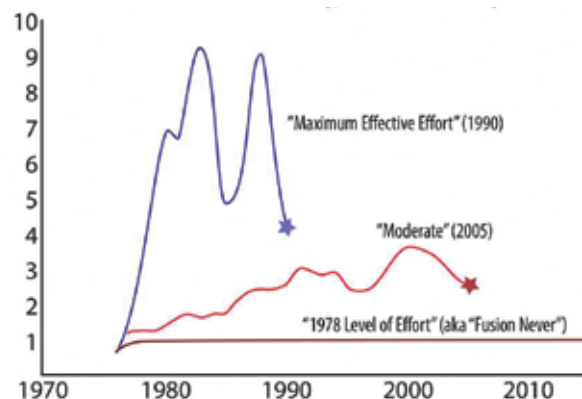
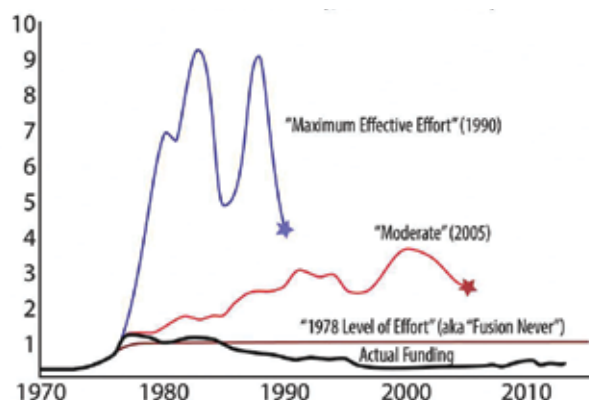


FIGURE 8
Actual U.S. Annual Fusion Budget
 (\$2012 Billions)



fied. So there's a lot more to the picture. But I think if you just look at the funding, it's pretty clear, given the fact that it was known what was needed, that this is a political intention, not a scientific challenge.

No Limits to Growth

The fact of the matter is, fusion is right around the corner, if it's not suppressed. Various estimates have been made—10 years, 15 years—that's a good range in which we could bring fusion power on-line.

The point is, that there's been no reason why we should have had this zero-growth policy. There's no reason why we should have accepted the last 40 years of economic insanity. And for mankind, there really are no limits to growth.

And just to illustrate this, I want to give a sense of what's available to mankind with nuclear processes. Just start with fission: Say we want to look at uranium as a fission fuel in the oceans. That would allow us to increase, according to one study that was done, our current global electricity usage eightfold. So, nearly an order of magnitude increase, eight times the current total global electricity usage. And if you powered this only with fission fuel, uranium, solely found in the oceans, they concluded that you could sustain that level for *5 billion years*. I don't think the Earth's even been around for 5 billion years! And obviously, we would increase our usage, we wouldn't maintain one level; but just get the concept that there's an absurd amount of energy available out there.

Now, if we tried to maintain that same level of activity with coal, petroleum, natural gas, you're talking in the range of 20-100 years. We can certainly use that as

a stepping stone, but the future of mankind is nuclear—but really, it's fusion.

To give another estimate of the absurdity of the limits to growth ideology: If we're serious about providing the world's growing population with the quality of life that human dignity requires, it means we have to go with fusion power. And we were playing around with some different ways to illustrate this, and one way that we thought would be fun, would be to take where the United States should be today, if we had continued President Kennedy's rate of growth. If we had continued this physical growth, we would be at something in the range of two to three times our current power usage per capita in the United States.

Now, say we applied that to the whole world population: two to three times the living standards that we have in the United States, applied to the entire population. Say you account for population growth, in a 50-year program, and you're talking about 12 billion people. So 12 billion people at three times the living standard that we presently have in the United States; if we were to try to support that level of per-capita energy, this measure of the power of the individual in society, if we were to support that with fusion fuel from the oceans, the heavy isotope of hydrogen in the oceans, deuterium, we could support that level, which is something on the order of 20 times our current global usage. There's enough fuel in the ocean for fusion to support this for 25 billion years!

And combining this with the fact that this has been suppressed, that this was *not* a scientific challenge we haven't yet overcome, that this was a political decision not to develop fusion, shows the whole zero-growth ideology to be a real genocidal fraud. And as I mentioned earlier, this would not be just more power for the same activities we do today. This is not just more energy for the existing economic systems.

This would be the power required to support the entire Pacific development perspective (**Figure 9**). Fusion power will enable entirely new methods of production. We can actually increase the productivity of each worker, so you can have less labor required to produce more goods for a growing population, with increasing living standards. The fusion economy will completely transform the very idea of "natural resources." Things that are currently useless to mankind—raw dirt, soils, ocean water, even potentially, literally, landfills and trash—with the energy densities of fusion processes, these can actually become economi-

cal sources of resources. We could utilize these things for the goods and resources needed to support society.

So, to put it simply, a fusion economy eliminates the concept of limited power supplies, limited resources, and it illustrates what is the fundamental point that mankind does not inherently have any shortages of resources, we have a shortage of technologies, and really, we have a shortage of political leadership, to create the kind of growth needed to enable these technologies.

So the point is, all of this is physically, economically, technically possible, over the next two generations. And with the current collapse, the utter breakdown of the entire zero-growth framework, the framework of the past 50 years, we have the opportunity to seize the next 50 years as a long-delayed era of global development, and a real maturation of the human species.

And so this is what we have on the table, right now, with the Pacific orientation. You have nations in Asia that have a serious commitment to the future. You have nations with a serious commitment to fission power, a serious commitment to developing fusion power; you have a desire for major water projects; a desire for the development of entirely new territories. You have a desire for general, physical economic growth, which we haven't seen in the United States in 40 years. And so, if the United States allies with these nations, we have a strategic alliance which can truly reshape the face of this entire planet and beyond, over the coming generations.

To conclude, I'll bring it back to the interesting point that I think we should all contemplate, with this perspective in mind: These two 50-year processes juxtaposed, where we have to locate our identity in this process, where you locate yourself as an individual in this process, and really think through the fact, that the source of all this, for the human species, the source of progress, the actual cause, is the creative action of the human mind. That the power of ideas, wielded uniquely by the human species, by mankind, is the fundamental source of human progress, and the future of future generations.

So, the contributions we make to that process, or

FIGURE 9

A Proposed Main Trunk Line for Pacific Development



that we don't make to that process, is specifically what defines us and the reason for our having lived. So I think, given the state of political affairs, with the crises and challenges facing our nation and the world today, I think it's very important to keep ourselves also rooted in this future perspective, where we can find a real source of strength and passion to win these political fights, to face the seemingly insurmountable challenges we face right now, and to succeed in securing the next 50 years and beyond, with this idea.

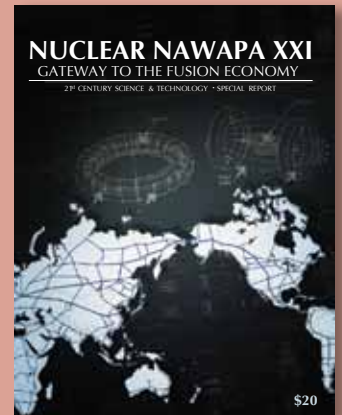
Nuclear NAWAPA XXI Gateway to the Fusion Economy

A 21st Century Science & Technology Special Report

By the
**LaRouchePAC Scientific
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