

ECONOMICS FOR THE FUTURE OF MANKIND

Self-Developing Systems And Arctic Development

by Michelle Fuchs and Sky Shields

It is becoming ever more clear that the reigning economic and political structures of the world today are dangerously dismal failures. We are presently watching the alarming spectacle of the largest and most severe economic collapse in human history. The euro system is unquestionably extinct, and there is a high likelihood that the combined nations of the trans-Atlantic system—including the United States—will be destroyed along with it.

In response to this collapse, rather than admit defeat and accept the necessary reforms, the financial and imperial interests who established this system, along with their lackeys—most notably, U.S. President Barack Obama—have opted for instigating a thermonuclear conflict, which they hope will prevent the rise of a new trans-Pacific alliance.

The threat of war remains so long as Obama retains his position as President of the United States of America. His immediate ouster will open the door for using Franklin Roosevelt's original Glass-Steagall policy to check the global system of predatory financial interests, and launch the physical-economic development policies required to pull us away from collapse and into a recovery. In this context, it is more necessary than ever not only to implement the policy measures which might counteract the last several decades of imperial looting, but more importantly, to understand the physical-scientific principles which underlie such needed policy measures.

Of what should these policies consist, however?

What is the basis for determining a successful, versus an unsuccessful, physical economic policy? Two economic proposals coming out of Russia in the recent weeks, one which has been named the Strategic Defense of Earth (SDE), and the other, an enthusiastic approach towards Arctic development (**Figure 1**), which we will take up in the course of this report, provide us with a platform for this discussion, and an opportunity to apply several crucial concepts of physical economy which Lyndon LaRouche has developed in a recent series of studies.¹

In particular, we must first elaborate the characteristics of a self-developing system—one whose evolution is entirely governed by its internal relations, not subject to any fixed outside metric.

Energy-Flux Density Requirements of a Self-Developing System

1) The history of human progress, like the historical development of Earth's biosphere, has demonstrated a steady increase in what LaRouche has termed "energy-

1. The following can be found at www.larouche.org: Sept. 30 LPAC National Broadcast; Lyndon LaRouche: Oct. 31, 2011 "Principle or Party?"; Nov. 9, 2011, "The Fall of the British Empire: Obama's Armageddon End-Game"; Oct. 15, 2011, "What is Creativity, Actually?: The Real Human Mind," Nov. 22, 2011; "A World at Its Wits' End: The End of the World's Wars," Nov. 29, 2011; "Reflections on a Work by Nicholas of Cusa." On the SDE specifically, see "LaRouche's SDI Resurfaces: As World War Threatens, Russia Proposes the 'SDE,'" *EIR*, Nov. 25, 2011.

FIGURE 1
The Arctic Region



flux density.” The margin of difference between the energy-flux density requirements of the system as a whole, and the actual energy-flux density expressed by given living organisms and human societies, is the determining factor in all extinction events of both living organisms and human societies. This energy-flux-density requirement is constantly increasing with the development of the galaxy, and of larger systems, as a whole.

2) If we accept only physically determined parameters in this process, as opposed to unnecessary constructs, the fact is that there is no simple baseline called “absolute time” against which to measure any

quantity such as Rudolph Clausius’s entropy. This is in fact the reason for Ludwig Boltzmann’s failure to account for his “arrow” of time. Physical time is only found in the margins between these differing rates of increase of energy-flux density—anti-entropy. This anti-entropy is not simply the opposite of Clausius’s entropy, but rather, has a very definite qualitative character which reflects the individual human creative process.

3) Therefore, “standing still” in these physical terms is not the same as a Newtonian sort of inertia. It requires a constant increase in energy-flux density of the system in order to keep the system at “breakeven.” A moment in this sort of physical time is actually a sort of state of flux, reminiscent of Heraclitus’ definition of “constant.”

These requirements correspond to what we might call the structure of physical-economic time. Thus, no simple collapse to an “earlier” point in economic time. We are not simply sliding up and down the hill of economic progress. The only

way to recover from a dark age, is to force the sorts of increases in energy-flux density that will make up for the attrition of the intervening period. During all of that time, we were not “standing still.” A zero-growth society is a collapsing one. “Standing still” can only be accomplished by increasing the margin of physical-economic productivity, in tandem with the steady increase of physical-economic consumption. In this respect, “standing still” in economic time is nothing other than irresponsibly managing to barely eke out that level of progress which is required to balance the attrition associated with the passage of physical time.

In other words, human progress is not measured against some fixed backdrop called absolute time, of the sort posited by Newton and taken to absurd extremes by Laplace. Human progress is measured against the constant evolutionary development of the universe as a whole. It is a relative time, defined by the relationship among physical processes of anti-entropic development. The so-called “zero growth” or “sustainable development policies” proposed by the lunatics known as environmentalists, are in reality policies of collapse. The attempt to stop human development will result—by their own admission—in the rapid death of 5 to 6 billions of people on this planet over the course of the coming decades. This is the policy of “population reduction” proposed by those promoting a “green” agenda. It is a genocide policy, which makes use of that peculiar fact of the physical universe which we have just discussed: It is not possible to simply stand still. It is as though the universe comes with a built-in sign reading: “Do not back up. Severe tire damage.”

The current situation in Russia, and its relationship to the necessary policy measures to be taken in the United States, will form an excellent case study for this discussion.

Physical-Economic Attrition: The Case of Russia

Take the case of the unfortunate failure of Russia’s Phobos-Grunt satellite (**Figure 2**) in early November. The Phobos-Grunt was intended to carry instrumentation to Mars’ moon Phobos, to retrieve Phobos’s soil for examination back on Earth, to study the atmosphere and radiation environment of Mars, and to carry out a more advanced investigation of the possibility of life on the Red Planet. At the same time, the satellite carried an array of microscopic organisms, to test the effect of the interplanetary environment on living organisms, paving the way for eventual travel to Mars by man.

However, after launch, the propulsion engine of the probe failed to be activated, and could not move the device out of Earth’s orbit and into the trajectory of flight to Mars. The probe now remains in limbo, hovering in ever-closer orbits over Earth, as it awaits its ultimate fall back through Earth’s atmosphere. Communications with the probe have essentially failed, with too little telemetry to even locate the source of the problem.

Whatever the technical problem turns out to have

FIGURE 2
Phobos-Grunt Satellite



The Phobos-Grunt satellite, launched Nov. 2, 2011, was designed to return samples from Mars’ moon Phobos, however, the propulsion engine of the probe failed to activate, and it continues to orbit around the Earth.

been, in the online journal *Aktualniye Kommentarii*, military expert Vladislav Shurygin describes the essential root of the broader problem as follows:

“Over the past 20 years, we have actually used up the old hardware and spent not very much time on updating it. Over this period, entire sectors of the aerospace industry, such as new materials development and space electronics, have been ruined. The industry is dead, and now it has to be created from scratch.

“Space electronics has been the main problem for many years. We destroyed our own industry and decided against developing it, hoping that we would get access to Western electronics. We have gotten nothing and we are not allowed to access the market for space level electronics, which can withstand radiation and other adverse effects of outer space. Nobody is eager to sell it to us.”

Shurygin said all of this is linked with programming, because software is written for a specific device and for specific tasks.

The 80-year-old Russian cosmonaut Georgy Grechko, the first human ever to perform an extra-vehicular “space

walk,” and a physicist who was twice named Hero of the Soviet Union, spoke very candidly about this situation to Interfax-AVN. He famously proclaimed earlier this year: “Man is man, because he is always drawn to go beyond the horizon. And thereby he expands the horizon for all humanity. If an animal has food, warmth, and a mate, it doesn’t need anything more than that. So, we either remain human and fly to Mars, or we’ll be animals.”

About the current situation underlying the Phobos-Grunt failure, Grechko said:

“What is our main trouble? The [federal space agency] Roscosmos chief spoke about it recently, although it is an open secret for specialists: The staff employed are either over 60 or under 30. There is no intermediate age group.

“A generation was lost for the space industry, when it was struggling to survive. People, most of them young, energetic, and talented, would seek higher earnings in other places. The space industry could not offer them any decent salary. Incidentally, even now salaries are not high enough in the space industry, and they are sometimes below the average federal or regional levels.

“We last launched such a sophisticated system [as Phobos-Grunt] some 25 years ago. Think what those 25 years mean for the space industry. A shift of generations occurred.”

What Grechko described is the shadow of an insidious, deliberate policy launched against the sort of human progress which is represented by an increase in energy-flux density. Despite the Soviet Union’s over-emphasis on the military-industrial complex, which led to its eventual collapse, as LaRouche had forecast it would in 1983,² the heavy scientific orientation that the post-World War II Soviet Union had built up was still one of the largest and best scientific cadres on the planet. The Soviet Union was launching spacecraft to Mars and Venus at a pace of one every two years, the maximum possible, given planetary positions.

However, with the dissolution of the U.S.S.R., and the onset of the “free trade” policies of François Mitterrand, George H.W. Bush, and Margaret Thatcher—representatives of the financial oligarchy—conditions of utter chaos and the criminal looting of Russia, replaced any line of scientific progress.

The collapse of the last two decades has been more than just a financial collapse. There has been a con-

scious targeting of the Russian nation for destruction by predatory financial interests—both those centered in the City of London and on Wall Street, and those within the country that were created artificially, and promoted to their dominant position by the ones outside.³ The goal of this decimation was not, however, simply the destruction of Russia, but rather the destruction of precisely the possibility of scientific progress that Russian culture had formerly represented for all of mankind, even under the Soviet system.⁴

For Russia, as globally, this has been a collapse in the physical, cultural, moral, and intellectual capabilities of the population. This included the criminalization

3. Rachel Douglas, “London’s ‘Our Men’ in Moscow Keep Poisoning Russian Policy,” *EIR*, March 26, 2010.

4. Lyndon LaRouche has identified Soviet science as a boon for all mankind, and fought throughout the 1990s and beyond to prevent its destruction by Wall Street and City of London financial interests. See the following by LaRouche: “Russia’s Science: A Strategic Assessment,” *EIR*, Aug. 8, 1997; “The Legacy of Mendeleyev and Vernadsky: The Spirit of Russia’s Science,” *EIR*, Dec. 7, 2001; “On Academician Lvov’s Warning: What Is ‘Primitive Accumulation’?”, *EIR*, Aug. 17, 2001; “Free Trade vs. National Interest: The Economics Debate about Russia,” *EIR*, June 12, 2008.

Breaking the Ice on Arctic Development



LPAC’s Michelle Fuchs reports on two sides of a potential global perspective for Arctic development: One, Russia’s planned Arctic City, dubbed “Umka,” which will be modelled on the International Space Station; and two, the planned expansion of the River Shannon Estuary, which will make Ireland a lead player in deep-sea science. (27 minutes).

<http://larouchepac.com/node/20614>

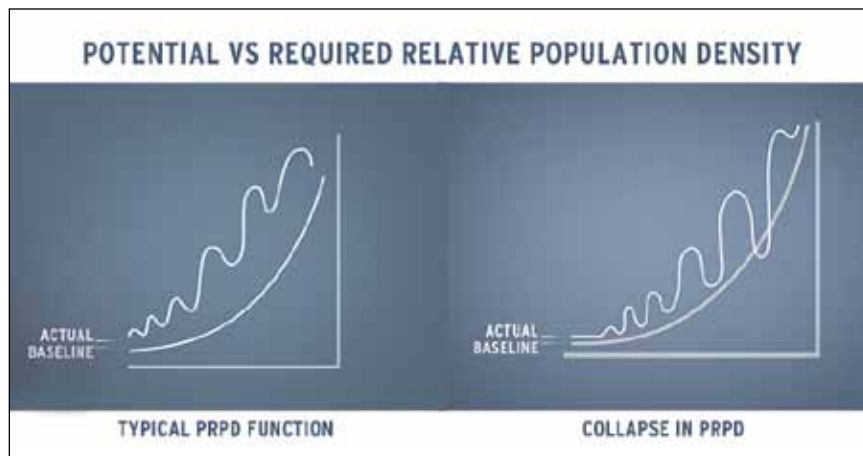
2. LaRouche at that time had given the Soviet Union “about five years” of further life, were it to continue its policies at that point.

of an entire generation, which had seemingly no other means of survival than to participate in the criminal economy that sprang up around the massive looting of Russia's raw materials, which were illegally shipped off to the West.⁵ Youth with access to education flocked to majors in "business" and financial services, rather than being trained for actually productive or scientific employment, while some of the existing aerospace scientists found it more profitable under a free-trade system to use their mathematical skills to aid the looting of the physical economy via the utterly psychotic derivatives market.

During this criminal devolution of the 1990s, of the approximately 30 million children in the country, by 1999, an estimated 2 million had become homeless, and an estimated one-third of all school-age children were not attending school. Drug use skyrocketed.⁶ Instead of developing their creative capacities, these youth turned to participate in a massive criminal underworld.

In the late 1980s, employment of scientists and science-related service workers in the Russian part of the Soviet Union had fallen to nearly half its peak level of 3.2 million, dropping to 1.3 million by 1997.⁷ Employment in industry in that period had almost halved from its 1988 peak, down to 11 million. Many highly skilled scientists were forced to work day jobs as street peddlers. Others, with little to no opportunity to participate in scientific research at home, were lured abroad in a systematic "brain drain," extracting Russia's brightest minds to the West, where they could receive significantly higher wages, oftentimes in activities unrelated to their

FIGURE 3



original professions.⁸ George Soros's infamous temporary stipend program for Russian scientists, beginning in 1992 (the year of 2,600% inflation), fueled this process.

The Oligarchical Principle

This was all part of a conscious policy of economic destruction known as the oligarchical principle. The interests who launched this attack then, are the same London-centered banking interests as those who have the world on the brink of collapse today.

This attack collapsed what LaRouche identifies, in his "The Science of Physical Economy,"⁹ as potential relative population density. This is to be distinguished from the collapse in actual population which necessarily follows such a collapse in potential.

That is, when the potential relative population density collapses (**Figure 3**), it is only a matter of time before the actual population density follows suit. The physical effects of such a process are not well represented by a curve on paper. They are the horrific human toll which we have seen spread through Russia since the collapse of the Soviet Union, which was partially checked when Vladimir Putin, as Russian President in 2000-08, moved to defend his country's sovereignty against the criminal oligarchical interests who had seized it.

The damage suffered in this sort of attack is not simply "moving backwards," as though against the empty time of Newton or Laplace. Rather, this attrition is

5. In 1996, Russia exported almost 417% of its production of uranium, and in one year, had exported 356% of the amount of molybdenum produced in the country, which means that the country's reserves were simply being sold. See Stanislav M. Menshikov, *The Anatomy of Russian Capitalism*, EIR News Service, 2007.

6. The country has at least 2.5 million drug addicts, with 80,000 young people trying heroin for the first time each year. Addiction rates are so high that Victor Ivanov, director of Russia's Federal Narcotics Service, reported that there are 30,000 deaths due to drug addiction of Russians in the 18-24 age group annually at this point.

7. Spending on R&D fell by 70% from 1991 to 1996, of which only 25-30% was actually received by state-funded science and technology programs.

8. By 1997, there were 25,000 Russian scientists working abroad.

9. See Lyndon H. LaRouche, Jr., "Economics as History: The Science of Physical Economy," *EIR*, July 11, 2009.

better understood as the relative motion between the steady anti-entropic growth and development of the universe as a whole, and the characteristically entropic collapse suffered due to the looting of post-Soviet Russia by international financial interests in the '90s and beyond.

During that period of looting, the necessary baseline for energy-flux density has been steadily increasing, even while the actual energy-flux density of Russia (and the world as a whole, under globalization) has been in a steady decline. This gap serves as a rough proxy for the gap between actual and potential relative population density. As a result, the energy-flux-density gap required to be closed by Russia has increased dramatically. This gap is as much cultural as physical—or more so. The destruction wrought against the minds of the population—in the form of the destruction of scientific competence and the introduction of the counter-culture—represents the more insidious collapse in potential.

It is not possible to make up this margin of collapse by acting on the process with broad investment strategies. Physical resources must be invested in a concentrated form at the frontiers of human knowledge and economic activity. Neglecting this was the fallacy at play in the arguments for cutting space programs to solve problems “here on Earth.” Economics is truly the “dismal science” when that becomes the policy.

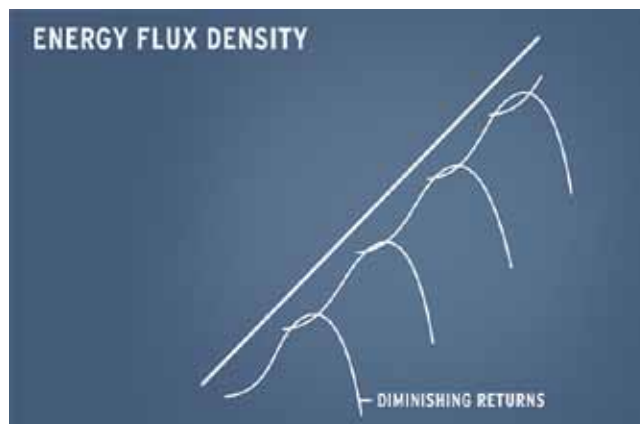


premier.gov.ru

The horrific human toll which spread through Russia since the collapse of the Soviet Union, was partially checked when President Vladimir Putin (2000-08) moved to defend his country's sovereignty against the criminal oligarchical interests who had seized it. Putin is shown here in September 2011 addressing the Second International Arctic Forum on “The Arctic—Territory of Dialogue,” in Arkhangelsk.

FIGURE 4

Rise/Fall Energy Flux Density



All physical economic value is generated at the frontiers of scientific progress, such as we saw with the Apollo program. The moment new frontier developments in an economic system cease, the system takes on the structure of a closed, logical deductive system, defined by a fixed level of technology and a fixed resource base. Such a system is—as the work of Sadi Carnot on such closed systems showed—inherently entropic. Such are the systems proposed as “green energy” systems, or “renewable energy,” which demand reliance on primitive technologies such as wind and solar power, and which are incapable of meeting even the margin of productivity required to ensure their own production.

Any closed system of this sort must inevitably collapse. Only the constant transition to higher and higher platforms of economic development can obviate this circumstance. In this way, a universe containing the human creative process is an entirely open system.¹⁰ And for this reason, investments must be such that, as with the Apollo program and its technological spillover, we attain a sufficient margin of anti-entropy to pull the rest of the system upward by its bootstraps, as it were. This is the concept of a self-developing system.

The necessity here, therefore, is not to retrace the exact same steps which initially gave the Soviet Union its capability for manned space travel. The collapse which has occurred is not towards some prior state, because the universe itself has been developing in the meanwhile (**Figure 4**). The universe does not sit still when we do.

10. In LaRouche's use of the words of Albert Einstein: “finite, but unbounded.”

To make up this margin of collapse, it is necessary to exceed the last peak. Rather than attempt to simply regain prior expertise in space, we must determine the next steps for human colonization of the Solar System, and begin to take them now. Two proposals which have been placed on the table by Russia in recent months have this potential, if they are executed correctly and in collaboration with the United States and China.

The first, which will be discussed elsewhere, is the proposal to replace Obama's bellicose British strategy of missile defense with a collaborative project known as the Strategic Defense of Earth. The second, to be covered here, is collaboration for the economic development of Earth's polar regions. But first, a discussion of the actual goal.

Our Extraterrestrial Imperative

Mankind's destiny lies in the stars, beginning with the colonization of our Solar System and galaxy. The Moon will be only a stepping-stone to an extraterrestrial system, and the Arctic its precursor. The Moon's unique characteristics make it an ideal location both as an industrial base away from the Earth, and as a launch pad for missions to Mars. Its low gravity and density of certain rare earth minerals, such as titanium, facilitate certain industrial processes, and other properties destine it to be the permanent way station between the Earth and interplanetary space.

However, this will require that teams operating the lunar outpost are able to survive for extended periods of time in this peculiar environment. The spacesuits used in mankind's first steps on the Moon were sufficient for initial forays into this unexplored territory, but future living and working off-Earth will require that wherever we go, we build livable habitations, where work can be done without wearing the equivalent of a mobile spaceship.

Unlike the Earth, whose protective atmosphere is so familiar to us that we don't stop to contemplate it, the Moon has no atmosphere, and thus there are certain real environmental considerations to take into account for

FIGURE 5
Sinuous Rilles on the Moon



A photo of the sinuous rilles taken by Apollo 15 (1971), east of the Moon's Aristarchus Plateau.

building cities there. Glass-domed surface dwellings will very likely be an impossibility, as any surface structure will be subjected to the same microscopic meteorites that constantly pummel lunar regolith into fine dust.

Radiation is also a huge challenge. The surface of the Moon is exposed to both cosmic rays and solar flares, as well as a dangerous spray of secondary particles, produced when cosmic rays hit the ground; these flow across the Moon's surface horizontally, suggesting that we may need more shielding on the sides of lunar dwellings than on top. At the least, several feet of lunar soil, or some other thick shielding, will be required to sustain human habitation. One of the more promising possibilities is for lunar colonies to be built inside lava tubes, a solution which addresses both challenges.

For decades lava tubes and the related sinuous rilles (**Figure 5**), have been observed in Moon imagery. Fred Hörz from the Experimental Planetology Branch of

NASA's Johnson Space Center, Houston, Texas, was the first to suggest actually living in lava tubes in his 1985 paper, "Lava Tubes: Potential Shelter for Habitats."

"Natural caverns occur on the Moon in the form of 'lava tubes,' which are the drained conduits of underground lava rivers. The inside dimensions of these tubes measure tens to hundreds of meters, and their roofs are expected to be thicker than 10 meters. Consequently, lava tube interiors offer an environment that is naturally protected from the hazards of radiation and meteorite impact. Further, constant, relatively benign temperatures of -20°C ¹¹ prevail. These are extremely favorable environmental conditions for human activities and industrial operations. Significant operational, technological, and economical benefits might result if a lunar base were constructed inside a lava tube."

In just the past few years, higher-resolution imagery of the Moon's surface from JAXA's Kaguya and NASA's Lunar Reconnaissance Orbiter (LRO) has added higher definition to how this may work, as imagery has exposed "skylights"—breaks in the surface of lava tubes—and access points tens to hundreds of meters wide, which could be used for entry and exit to and from a lunar colony underground.

These sorts of requirements are what we must have in mind when discussing future developments here on Earth. It is not sufficient for any given economic policy to ensure our species' momentary survival. Any healthy human economic policy for the present must contain within it a sufficient margin of anti-entropy to allow for the sustained survival of the human species, over the coming century or more. This means that our actual goals must be vectored towards our ability to maintain human civilization on both the Moon and Mars, as well as potentially better-controlled, artificially constructed habitats in interplanetary space.

11. Over the course of the two-week-long swing from lunar day to lunar night, the Moon's surface temperature fluctuates from -233°C to 123°C .



U.S. Air Force/Senior Airman Joshua Strang

The Arctic is truly "Earth's window to space," a new and necessary frontier for humanity, where a cultural renaissance will take place in the near future. Shown: the Aurora Borealis, or Northern Lights, above Bear Lake in Alaska.

The establishment of mining facilities on various planetary bodies, including the unbelievably mineral-dense asteroids within our Solar System, will render the phrase "limited resources" even more meaningless than it already is. And the establishment of a Solar System-wide study of high-energy interplanetary phenomena will finally grant humanity complete control over weather and climate phenomena here on Earth, which currently seem beyond our control.

This kind of vectored thinking, towards mankind's inevitable destiny in the stars, can be seen in certain aspects of recent proposals for the colonization of Earth's Arctic.

Earth's 'Window to Space'

Humanity has, up until now, survived in a womb of sorts. We were born into this biosphere, and into our bodies, as naive dwellers with little sense of how either operates. We've survived off of a bounty of unknown-to-us origin, and were plagued by natural powers initially so far beyond our comprehension that we attributed them to capricious gods.

Little by little, we came to understand the sources of the processes which fed us, to the point where we were able to increase their effectiveness far beyond the state in which we found them, developing entirely new species by means of agriculture, animal husbandry, and

now, even more direct biological methods. This was an application, and amplification, of the trend of a steady increase in energy-flux density which had already characterized the prior development of the biosphere.

Just as mammals superseded the less “capital-intensive” reptiles, energy-dense fruit-bearing plants superseded the more energy-diffuse ferns, and the general trend of the system was in such a direction across such things as the K-T (Cretaceous-Tertiary) boundary: Human activity increased the ratio of fruit-bearing and other energy-dense mass in these same processes. In the course of this development, we gradually found natural disasters to be only as uncontrollable as they were not understood. As we now begin to look to the Sun and beyond, for the causes of meteorological phenomena here on Earth, we truly begin to approach becoming complete masters of the domain in which we reside.

As the biosphere gives way to the noösphere—the sphere of human cognitive activity—more and more of these processes come under our power, and are subject to our creative action. All of this, however, is merely preparatory work, in the womb of Earth’s biosphere, for what you might call our eventual “birth.” As we’ve discussed elsewhere, our mastery of the environment into which we found ourselves tossed is somewhat akin to finally cutting our umbilical cord, and learning to eat with our own hands and mouth. Ultimately, humanity is destined to make the entire Solar System—and galaxy, and beyond—habitable. This process begins here, in the Arctic Circle.

Keeping human beings alive in environments far removed from those of Earth, our womb, is in fact the goal. In this respect, calling the Arctic “Earth’s window to space” becomes even truer than when that phrase was first coined. Initially it referred to the invisible

FIGURE 6
Domed City of Umka

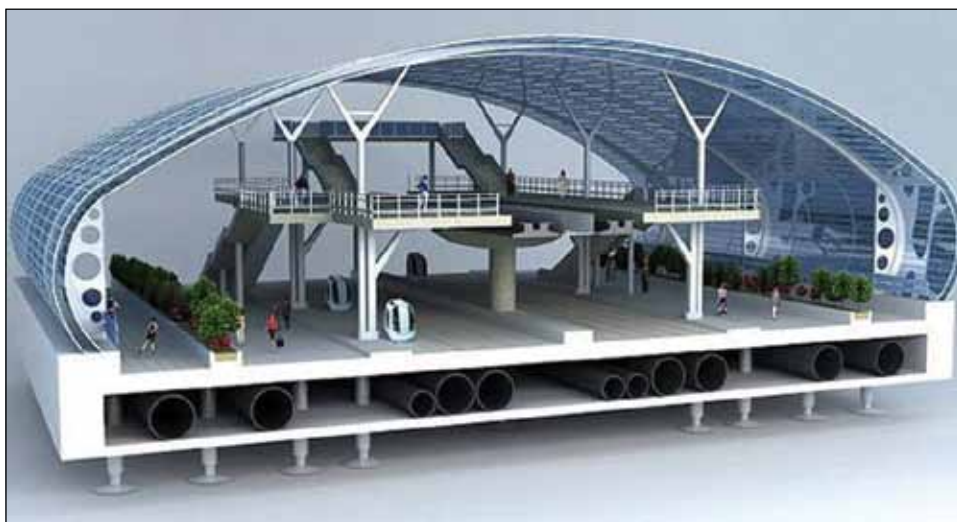


FIGURE 6a
Kotelny Island in the Novosibirsk Archipelago



northern and southern polar portals out of our atmosphere—an influx of extraterrestrial radiation of which the Aurora Borealis and Australis were only the beautifully visible fringe. Now, it signifies further that the Arctic is our window to space as a new and necessary frontier for humanity: the place where a new cultural renaissance will be fostered, much as the United States realized Nicholas of Cusa’s plan of building humanity’s

first true republic on shores distant from the feudal backwardness of Europe. At the same time, here in the Arctic is where we will develop the technologies necessary to achieve that destiny in the stars.

In September 2011, Russian Prime Minister Vladimir Putin attended the Russian Geographical Society's Second International Arctic Forum, entitled, "The Arctic, Territory of Dialogue," where he viewed, among other things, the plans of Russian architect Valeri Rzhnevsky for what is being called a "wonder city," named Umka (**Figure 6**), deep within the Arctic Circle, on the remote island of Kotelny (**Figure 6a**), in the Novosibirsk archipelago. The location is some 1,000 miles from the North Pole, closer than any other Russian city. The initial 5,000 residents of the city will be composed of scientists, engineers, and workers for local mines and oil platforms. It will necessarily be an entirely self-enclosed, self-sustaining city, due to the complete inhospitability of the climate this far above the Arctic Circle.

The workers will be occupied in mining and developing the vast mineral resources of the Arctic Circle. A joint study by the U.S. Geological Service and the Canadian Coast Guard estimates that the area north of the Arctic Circle accounts for about 13% of the world's undiscovered oil, 30% of the undiscovered natural gas, and 20% of the undiscovered natural gas liquids. Other studies have estimated that the Arctic has some 9,000 mineral deposits.

The pathway to this island city is equally laden with riches. Russian Siberia, an area one and a half times the size of the United States, but with only 38 million people (including large cities on its eastern Pacific coast and western Ural mountain fringes), contains an estimated 16% of the world's minerals. Siberia, alone, contains 90% of the world's palladium, 80% of its tantalum, 40% of its platinum, 36% of its nickel.

Along with mining this mineral wealth, the scientific researchers living in the city of Umka will be engaged in plumbing the even richer depths of undiscovered knowledge in the biological and physical sciences there in the Arctic region.

The real beauty of such an endeavor is best seen from the extraterrestrial standpoint we mentioned earlier. At this extreme latitude, strong winds dominate, and temperatures sink below -30°C—the same temperature as within the lunar lava tubes—and even in Summer, rarely climb over the freezing point. These hostile conditions provide an excellent opportunity to

develop and apply the technologies which will be needed to conquer the next frontiers for mankind: the Moon and Mars.

The giant dome enclosing such a city is just the beginning of how these explorers will be protected from the hostile environment. With few comforts provided by the local terrain, this sort of design shares with space exploration the quality of having to bring everything from home, including all life-support systems. In fact, the designs for the city are based on the International Space Station, with its own specially regulated temperate climate. Electricity will be supplied by a floating nuclear power station of the type that Russia is planning throughout the Arctic.¹² The goal of such a system is to be totally self-sustaining.

All biological cycles, both of plants and animals, will have to be worked out in detail, with the greatest efficiency, down to air circulation. Nitrogen fertilizer can be used to concentrate the nutrients that plants consume. The cycles of oxygen and growth-stimulating carbon dioxide will have to be self-contained within the domed city, minimizing contact with the frigid outside environment.

Adequate food will have to be supplied. A nuclear city in the Arctic would be a perfect place to experiment with fish farming, as it has been observed that warming river temperatures by even a few degrees sig-

12. Rejecting either a gradual increase in power density, as from wood to coal, to coke, to oil, etc., or the suicidal calls from environmentalists to move backwards to more primitive and less energy-dense sources of power such as solar or wind, this policy will make the highest-density power source mankind has yet brought under his control, the first source of power for new cities within the Arctic Circle. The current planned fleet is for eight floating nuclear stations, a prototype of which is being constructed at the SevMash shipyard in Severodvinsk and is timed for completion in 2012. They will consist of two reactors on a football-field-size barge, which will be floated to a port offshore Arctic cities, and connected with power lines to mainland. These plants can supply electricity and heating for communities of up to 45,000 people, and can stay on location for 12 years before needing to be serviced back in St. Petersburg. After the 40-year lifespan of the plant has passed, it can be floated away and replaced with a new one.

Challenged on the safety of these plants, a spokesman replied, "There's no need to worry about our technology. We have 50 years experience operating nuclear-powered icebreakers in extreme conditions."

Russia also has a 50-year history of operating a fleet of nuclear submarines, which deal with the challenge of nuclear power at great pressure depths under the sea.

The dual challenge of operating floating nuclear power plants, and doing so in the extreme conditions of the Arctic, is an exciting prospect. And it again breaks the rules of what is allowed under present economic conditions, increasing the potential relative population density of the region by magnitudes.

nificantly increases the number of fish. Design considerations aimed at preventing psychological strains on the city's human residents due to isolation and confinement include additional facilities (e.g., recreational) to help people forget that they are in an enclosed city.¹³ The city is intended to have zero waste, as waste will be reduced to less than ashes at specially built facilities.¹⁴

"So far it's the only project in the world with an artificial climate and integral life support—just like on the space station. It is a new world not only in architecture, but in human living too. We have used aero and space technologies while creating it.... This project is designed to work on any surface, even on the Moon, if needed," said Rzhevsky of his design.

The Arctic and NAWAPA

This is an exercise in increased energy-flux density. In this remote region, you are building an area whose density of energy throughput will be far greater than anywhere else on Earth. The effect will be that the energy consumption per capita will be much higher, as the density of activity and people will be increased. This density of investment will transform the productive potential of the human species by orders of magnitude. The resulting potential relative population density of Kotelny Island (23,165 km²), within the confines of the city itself, at 1.2 kilometers long and 800 meter wide, with a population of 5,000, will nearly rival Hong Kong's of 6,349 inhabitants per square km.

The very existence of this development on the island of Kotelny will raise the potential of the Arctic as a whole. The city design for Umka has already been proposed to all of the five nations possessing an Arctic coastline, and in fact echoes earlier plans for developments in each of those regions. Such domed cities were already a part of former Canadian Prime Minister John Diefenbaker's plans¹⁵ for the economic development of

Canada's Far North, for example, and should be revived in the course of Canadian and American adoption of the North American Water and Power Alliance as policy (NAWAPA, see below).

The ploy of the Queen of England and her Royal Consort Prince Philip to use native populations with fictitious "environmental" concerns as pawns against development across the planet, has in recent decades stopped Canada, under patriots like Diefenbaker, from making Canada's vast northern regions accessible. Now the pioneering actions by Russia are forcing the hand of Canada and the rest of the world.

The effect of this is like Sputnik earlier, which launched a space race, and consequently opened up possibly the most physically productive period in human history. This is the exact opposite of what the British tried to maintain as policy in Canada, pretending to defend native rights by declaring certain regions to be undevelopable "native" lands, but really dooming the Inuit peoples and the rest of Canada to a grueling self-destructive backwardness—the same policy they applied in Africa and India.

In fact, the new developments in the Arctic are stirring unrest in all of the Crown's "possessions," as members of the Scottish Parliament call for Scottish involvement in Arctic development as a major focus of the Scottish independence movement,¹⁶ and the LaRouche Science Brigade in Ireland lays out plans for Ireland to regain its historical sea presence, and surpassing British dominance by providing a port for the Arctic shipping routes which pass their northern coasts.¹⁷

clear power plant.

16. Angus Robertson, the leading MP in the pro-independence Scottish National Party, has been very vocal in decrying British negligence with respect to Scotland's northern frontier on the edge of the Arctic Circle, between Norway and Iceland. Robertson and other members of the SNP have declared that attention to Arctic shipping routes will be an absolute priority for a Scotland freed from the rule of the British Empire.

17. In October 2011, the LaRouche Irish Science Brigade launched a significant flank against the British intention for Ireland to collapse with the doomed EU system. It released a policy paper outlining the agenda for a free Ireland, which will become a keystone nation in the coming trans-Pacific alliance. The paper, titled "Ireland—An Economic Revival: Based on Marine Transport, Engineering and Scientific Exploration," identifies Ireland's historical legacy as a sea power, and the geostrategic advantage of its being a maritime nation located along the crucial Arctic shipping route. The Science Brigade identifies that the source of Ireland's failure to develop its maritime advantage in recent centuries has always been its relationship with the British. Quoting free Ireland's great patriot Arthur Griffith: "The mercantile marine of Ireland was numerous and powerful. After the definitive establishment of English power in Ireland by Queen Elizabeth [I], it was decreed treason to

13. Russia, with international collaboration, recently completed a research series, known as the Mars 500 Project, on the possible psychological and physiological effects which will be experienced by cosmonauts confined in spacecraft for the longer durations required for future space missions, for example, to Mars and other planetary bodies.

14. Those who are familiar with the technology of the common Russian household oven will recognize the clear feasibility of such an endeavor.

15. The plan for a domed city at the Frobisher Bay (since renamed Iqaluit), located at 62°49'59" North latitude, well within the Arctic Circle, was to build a city in the Arctic "where the costs of living and comfort of the people would be equal to that of a person in Toronto," which would house 4,500 people, and whose keystone would be a small nu-

FIGURE 7

Russian Federation: Rail Routes



EIR, The Eurasian Land-Bridge

The August 2011 conference in the Siberian city of Yakutsk, “Comprehensive Infrastructure Development in Northeast Russia: from Limitations to Growth,” focused on the project to link the Eurasian and North American continents via a Bering Strait bridge/rail connection. As of November 2011, this rail extension had reached Yakutsk.

A major focus of the August 2011 conference in the Siberian city of Yakutsk, “Comprehensive Infrastructure Development in Northeast Russia: from Limitations to Growth,” was the project to link the Eurasian continent to the North American continent via a Bering Strait bridge/rail connection. Russia has already demonstrated a commitment to its side of the project: the state-owned Russian Railways company intends by 2030 to extend rail lines all the way to Uelen, on Russia’s side of the Strait. As of November 2011, this rail extension had made it to Yakutsk (**Figure 7**).

Such rail connection and integration is the most crucial first step toward the development of Siberia and the Arctic North. As Dr. Victor Razbegin, acting head of Russia’s Council for the Study of Productive Forces, said:

“The only link that remains before the continents

export Irish goods in Irish vessels. Irish shipping was destroyed or seized by England and it was forbidden for an Irishman to own a ship. Subsequently, Ireland was forbidden to export to America aught except victuals, horses, salt and people.”

By first renouncing all ties with the British Empire, Ireland can develop, both by becoming a major port city with the construction of a deepwater port in the Shannon Estuary, and by taking the lead in astrobiological science through deep-sea exploration.

One of the new initiatives the LaRouche Irish Science Brigade is now investigating is the revival of the great Belfast shipyard, by building nuclear-powered icebreakers as part of the coming renaissance in the Arctic.

are connected, is 4,000 km in Russia and 2,000 km in Alaska and Canada, so this is a key, pivotal project for developing the entire infrastructure of our Northeast. The project is for building an integrated main line, not only a railroad, but a highway and an electric power transmission line, linking the power grids of the continents. After we build this segment, four out of six continents will be interlinked by these systems.”

The rail projects will involve more than just laying rail on top of inert ground. This will mean the development of Siberia, both in resource extraction and the subsequent processing of those resources into higher-value materials, and development of increasing areas fit for human habitation.

Another aspect of the Russian plan for Far East development includes the creation of entire new cities, located far from any areas that may now be considered hospitable, and with vectored scientific objectives.

On Aug. 11, Russian Federal Space Agency head Vladimir Popovkin confirmed the intent to complete construction of the Cosmodrome Vostochny (**Figure 8**), Russia’s new space launch center, by 2018. Over a period of five years, 30,000 workers will build research centers, an academy for young scientists, a cosmonaut training center, and space manufacturing facilities, in the Amur Region near the Russian-Chinese border. Other science-cities are intended, including one at the

FIGURE 8

Proposed Vostochny Space Center

The Cosmodrome Vostochny, Russia's new space launch center, is planned to be completed by 2018. Over a period of five years, 30,000 workers will build research centers, an academy for young scientists, a cosmonaut training center, and space manufacturing facilities, in the Amur Region near the Russian-Chinese border. The map shows the launch trajectories and first-stage drop zones.

national innovation center in Skolkovo, near Moscow.

In this way, Russia has the ability to overcome the decades of collapse in its space program, by reaching beyond what were once the frontiers. Only an increase in overall energy-flux density beyond the prior peak, at the height of the Russian space program, could counteract the attrition which has been suffered during the intervening decades of free-trade looting and cultural destruction. This “leapfrogging” is the only way to provide the margin of anti-entropy which is required to ensure the successful, sustained survival of the human species. It consists in applying an investment not across the entire population diffusely, but rather directly at the frontiers of human knowledge, in the most energy-intensive form possible.

There is no room here for “off-the-shelf technology,” or baby steps of any sort. The investment must be what LaRouche has called a “science-driver project”—like the U.S. Apollo project—where the investment multiplies itself, physically, by virtue of accomplishing that which has never been accomplished before, and that which, from the standpoint of the existing “rules of the system,” was formerly impossible.

The U.S. presence in the Arctic would have a similar effect, if executed from the standpoint of NAWAPA, whose immediate implementation, in a post-Obama world, has been called for by LaRouche. Indeed, without the collaboration of the United States and Russia on these developments, the full potential of neither side could be realized.

The Crucial American Dimension: NAWAPA

Under NAWAPA, the state of Alaska will become a part of a catchment system, designed to capture 160 million acre feet of freshwater annually—20% of the freshwater that is wasted every year as it runs back into the salty seas surrounding the state. This water will then be directed down through a network of new cities in the Canadian West, and will ultimately be used to green the Great American Desert shared between the United States and Mexico.

This catchment system will require six new Hoover Dam-style mega-dams in Alaska, two of which will be the biggest in the world—over 1,000 feet; four mega-dams in Northern Canada; nearly 3,000 miles of rail in Alaska, and 7,000 miles of rail in Canada; five new cities in the Yukon and Northern British Columbia, and adjoining Alaskan territory as part of the catchment system; and about 15 other cities to facilitate development throughout the rest of Alaska, either entirely new, or built up from virtually nothing today, cities whose design should be equally as forward-looking as that of Umka.

This development, combined with the obvious next step of linking that rail across the Bering Strait to meet the related rail development projects in Russia, planned as part of the eastern development policy, will transform the physical-economic topology of the globe. The Arctic Circle and the Pacific Basin—the regions of Russia's Far East, Alaska, and northern Canada—once the most backward regions of the planet, will now become its very center. These cities will lie along the path of a new Silk Road, connecting the southern tip of South Africa to the southern tip of Argentina.¹⁸ The profit here is to be found in the size of the leap. The margin of transformation in this region is the hugest possible, and the technology and productivity increase which will result will be massive.

18. Once the construction of this route has been completed, we will have the opportunity to initiate a new sport, symbolizing this connection from pole to pole. The details will have to be worked out, but part of it should involve feeding penguins to polar bears, or vice versa.

World Sea Routes



of the alternative route through the Suez Canal. Along with this Northern Sea Route, we also see opening up other routes, such as the Arctic Bridge, and the Canadian Northwest Passage (**Figure 9**).

This sort of policy outlook is not an optional one. The constraints on possible choices of policy direction are physically determined by the same universal physical principles which govern all anti-entropic progress—the progression of physical, as opposed to mathematical time. Any attempt to prevent this sort of development will result in an economic collapse, followed quickly by the war and unrest which such a collapse must necessarily engender.

In fact, the self-consciously creative identity which such a policy reflects will have to form the basis of a Classical Renaissance in the Earth's Arctic. The identity of the individual human being must be extended far beyond the confines of a single nation, or even a single lifetime, to a self-conscious identification with the development of all humanity, past, present, and future. In that sense of self, and only in that sense of self, can we find the sustainable survival of the human species.

That is the sense of self which is referred to more precisely as human immortality, transcending the bounds of a single mortal body, and confirming mankind as the first truly immortal species. It is exactly this development that imperial policy seeks to prevent. The bellicose posturing of Obama, and the cowards in the U.S. Congress who refuse to oppose him, will lead inevitably to a thermonuclear conflict with Russia. As before, however, the target is not only Russia itself, as a nation, but rather the potential for development that a Russian-U.S. trans-Pacific alliance would represent.

This is the end goal of the oligarchical principle in all of its forms—the right-wing warhawks and the left-wing environmentalists, inclusively. They seek to halt human progress, and to effect a drastic, genocidal reduction of the human species by several billions of people. They are a sort of predatory species, distinct from humanity—a species now overdue for extinction, if we are to see humanity survive. Will you join us in organizing to turn this threat around, now?

Released on Thanksgiving 2011, the LPAC-TV documentary "NAWAPA 1964" is the true story of the fight for the North American Water and Power Alliance. Spanning the 1960s and early '70s, it is told through the words of Utah Senator Frank Moss. The 56-minute video, using extensive original film footage and documents, presents the astonishing mobilization for NAWAPA, which came near to being realized, until the assassination of President Kennedy, the Vietnam War, and the 1968 Jacobin reaction, killed it
... until now.

NAWAPA 1964

PUEBLO, COLORADO
AUGUST 16, 1962

<http://larouchepac.com/nawapa1964>