Panel 3 Discussion

This is the edited transcript of the Discussion Session immediately following Panel 3, "Principles of Science for Durable Economic Progress," of the Schiller Institute's June 18–19 Conference, "There Can Be No Peace Without the Bankruptcy Reorganization of the Dying Trans-Atlantic Financial System." Participating in the discussion were Stephan Ossenkopp (moderator), Jason Ross, Prof. Francesco Battaglia, Prof. Sergey Pulinets, and William C. Jones. Dr. Edward Calabrese was unable to participate in the discussion.

Stephan Ossenkopp (moderator): Before I pick up some of the questions, I want to ask for some comments on what some of the speakers have said. Jason, you argued that evolution has an upward directionality, but this strikes at the very heart of the ecological movement and its pseudo-scientists, because they are basically oriented toward the movement downward. This was very much popularized, as I recall, by Herbert George Wells in his book *The Time Machine*, where his argument was that every civilization has a zenith, and then it goes down. At the end, there are just some giant crabs, and the Sun is a red giant, and everybody has died out. You're going against this pessimist ideology; what do you think about this?

Jason Ross: There's an argument made that evolution doesn't have a direction, and that worms today and the human species are equally well-evolved, simply because we both exist at present. Since we both find some niche in the biosphere today, we both had time to develop over millions of years, and therefore we're equally fit. [Vladimir] Vernadsky himself presented a couple of metrics for looking at the direction of evolution and the change of evolution. I mentioned those; a couple of these are about the energy-flow through individual organisms, as well as changes in the biosphere as a whole over time.

One of the examples Krafft Ehricke points at for thinking about how major shifts occur in the biosphere, is the creation of photosynthesis. In terms of where organisms get their energy, it's thought that the first life on Earth simply ate chemicals, or lived off of chemical energy. This still exists today with some things that live in the crust of the Earth or especially we see these really amazing assortments of life that are found at the bottom of the ocean, at these [hydrothermal] vents that are emitting sulfur-containing compounds and others that they're able to use for energy.

Compare that to the extra-terrestrial energy source that powers essentially almost all of life on the planet today—the Sun. Life uses an extra-terrestrial power source, and the development of photosynthesis means that the quantity of life that can exist on the planet has increased many, many orders of magnitude, by the ability to use sunlight. The total amount of biomass has increased, because now you have the plants and things that eat the plants, and so on. Then, we've seen concentrations of energy within the biosphere, including by our own doing. So, the creation of fruit trees, and breeding them to have more delicious and big fruits; the kinds of things that provide energy for animals that need a lot of it—birds, and things like this.

We've seen the amount of energy used over an organism's lifespan per gram of its mass, change, in shifts, from older forms of life that developed and arose earlier—like reptiles—compared to mammals today.

So, really, evolution isn't a random thing. It's not just the Darwinian idea of hereditary changes and then the "survival of the fittest." I'm not saying that's totally wrong, but when you look at these kinds of major shifts that have occurred, there's a lot more than that. And it has a *direction* just as our economic development has a *direction*. It has a place that we're heading; it's not just random motion, it's growth.

Ossenkopp: Here's a question for Professor Battaglia in Trieste. It comes from a leader of the Schiller Institute in Milan, Liliana Gorini:

"Thank you for your very clear presentation. I was wondering, was there ever any response to the open letter that you and hundreds of other Italian scientists sent to Italian President [Sergio] Mattarella and other institutions on the fraud of climate change?"

Prof. Francesco Battaglia: Not at all. There was *no* response. Actually, that letter was sent not only to the Italian President Mattarella, and to the Prime Minister at the time, Mr. [Giuseppe] Conte. But it was translated into English by the CLINTEL [Climate Intelligence] group in Holland, and was transmitted in a letter to António Guterres, the Secretary-General of the United Nations, with 1,000 signatures. The first signer was Professor Ivar Giaever, who has a Nobel Prize in physics.

That letter was ignored by the mainstream media.

Ossenkopp: Well, maybe for a reason. I would like to direct a question now to Professor Pulinets, of two elements, the first my own.

"You have shown us the impact and the magnitude of the Global Electric Circuit, and the impact it has on our—for example—weather patterns. This is something that is largely ignored by the so-called climate scientist groups in the West. They are defining the Earth's system as closed like a goldfish bowl. Maybe you can respond to that in the first part of your answer."

And there was also another question from a conference attendee:

"You talked about cosmic rays, but I didn't hear you mention cosmic rays affecting volcanoes. I have heard that cosmic rays from the Sun can cause volcanoes to erupt and spew volcanic ash into the atmosphere, blocking the Sun and lowering temperatures. Have you ever heard of global solar minimum and global solar maximum?"

Prof. Sergey Pulinets: I will start first with your question. We should take into account the periodicity of solar activity and, following that, the periodicity of galactic cosmic ray activity, because during the maximum and the minimum of the solar activity, we have different pictures of precipitation and weather, etc. So, in creating forecasts, we should take into account the space impact on our weather. In general, the meteorologists do not take into account electro-magnetic qualities in the different atmospheric formations, like hurricanes.

During the development of hurricanes, we see thunderstorm discharges. There are electric currents inside the hurricane. The electric current is moving through the geo-magnetic field. Interaction of the electric current and the geo-magnetic field plays an important role on the trajectory of the hurricanes. There are strong electric fields at the top of the hurricanes that penetrate the ionosphere and create irregularities of electron concentrations in the atmosphere. All these effects are not taken into account, even by the meteorologists.

About the second question: No, I don't talk about the effects of cosmic rays on volcanic eruptions. There is some coupling between the solar geo-magnetic activity and seismic activity, but it is not a direct coupling. There are some doubts about this, and this question still is under discussion. But I do not neglect the possibility of the effects of the solar geo-magnetic activity on the seismic activity.

Speaking about volcanoes, a volcano is a secondary part of this, and probably it has a similar effect, but I do not claim and cannot say that there is a direct effect of cosmic rays on volcanic activity.

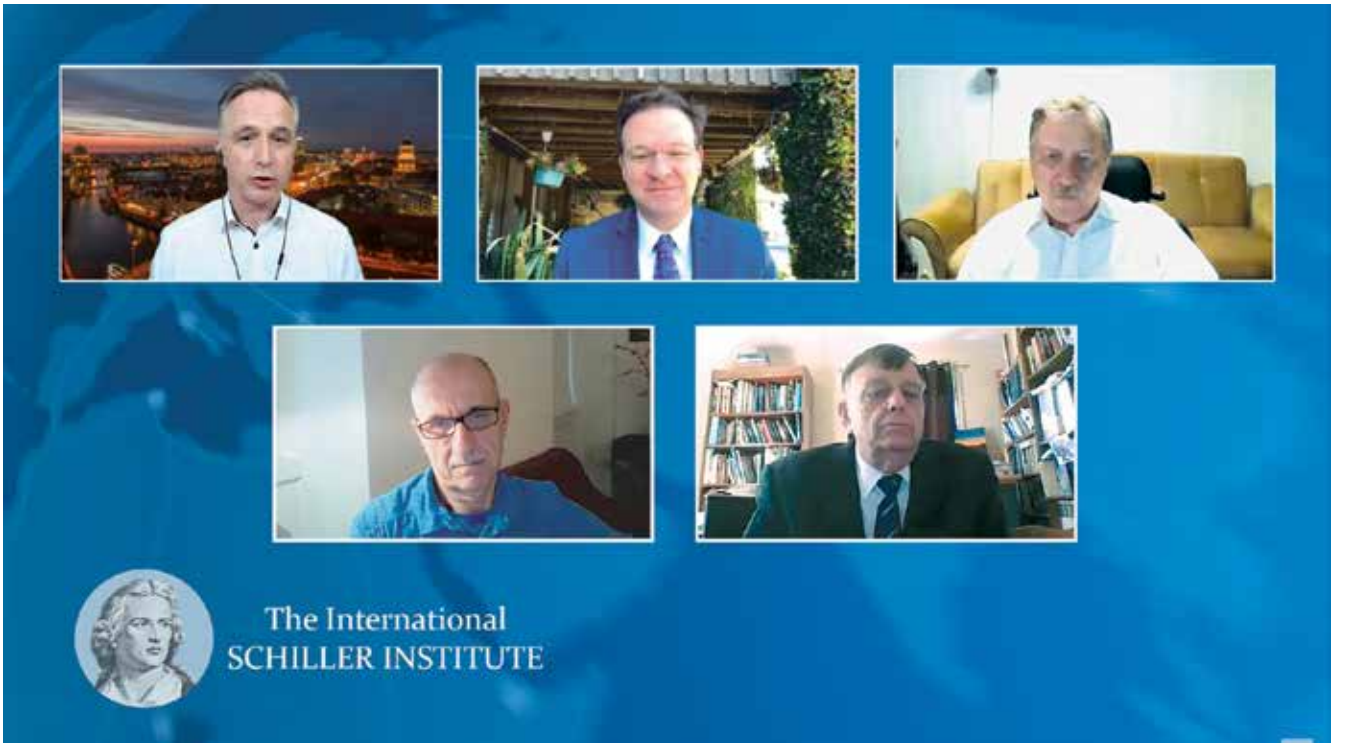
William Jones: Could you say anything, Sergey, with regard to the collaboration between Russian and Ukrainian scientists today? How has that been affected? Given the intensive campaign against Russia in Ukraine, how is that affecting that collaboration which has existed?

Prof. Pulinets: It is a very difficult question. Actually, we had very strong collaboration between Russian and Ukrainian scientists. We had continuous exchange. For example, Kyiv University, Kharkov University, Space Agency of Ukraine, and various Russian institutions and universities all took part in our conferences; we participated in their conferences. We have common publications; you can find them easily.

But now, it is very difficult, because some Ukraine scientists are under pressure and even have accepted this ideology which is exhibited by the Ukraine government. There were some cases, in communications between scientists, that some Ukraine scientists requested to punish Russian scientists for the intervention of Russia to the Ukraine. Doubtless, Russian scientists have nothing to do with this. Now, Russian scientists are prohibited in Ukraine, and Ukrainian scientists are prohibited to cooperate with Russians. We expect the finishing of this conflict to re-establish these relationships.

Ossenkopp: There is one question that came in about Vernadsky, but also LaRouche. I would like to direct the question to Bill. It's from Isa Martínez, and she says the following:

"Records show that many of Vernadsky's groundbreaking ideas were utilized throughout [subsequent] history, but many scientists in the West failed to cite him by name, despite the fact that Russians and Ukrainians alike have celebrated him as a scientific genius. LaRouche faced similar hurdles throughout his career as a political forecaster, economist, and innovative thinker. What do these men have in common, and why has society drawn away from fully honoring them and their accomplishments?"



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Participants in the Discussion Session of Panel 3, clockwise from upper left: Stephan Ossenkopp (moderator), Jason Ross, Prof. Sergey Pulinets, William C. Jones, and Prof. Francesco Battaglia. Prof. Edward Calabrese was unable to participate in the discussion.

Jones: Well, I think part of it is because of what the mainstream has become, which rejects more and more the notion of progress, especially with those with such a cosmic vision as LaRouche and Vernadsky. These were people who were looking centuries back and centuries forward in designing policy for today. And the empiricists or the pragmatists don't really want to accept that kind of a vision.

But there are different reasons for it. The problem that Lyndon LaRouche had was that the British Empire was still very much alive, and still very much alive here in the United States. It was in particular his attacks against Britain and the consequent following of the United States in British footsteps in much of its foreign policy that got him into trouble at a time when he was actually an advisor to the President, effectively, over the SDI.

With Vernadsky, it's different. On the one hand, there's an attempt to make him into a spiritualist, and the noösphere into something mystic, which is a total misunderstanding of what he was doing.

The other thing is the fact that his works are generally not available in the English language. The reason that he is well known today in the United States, I would say, is because Lyndon LaRouche really adopted his policy, made him into a figure through LaRouche's political activity here in the U.S. Actually, Jason and I and others were involved in that. We translated Vernadsky's works and published them. If you go on the internet today, and you look up Vernadsky in English, you're going to find mostly our publications, plus the famous classic view of the publication of *The Biosphere*. But all the other stuff is not there.

I would like to relate that to what Professor Calabrese said with regard to science education, which I think was very important. He said that you don't go back to the latest thing that has been written; you go to the earliest and try and follow the progress of the ideas. Lyndon LaRouche was insistent on this. If you want to encourage creativity, which is the basis for scientific activity—it's not rote learning—you have to go through the process of the minds of the great thinkers.

That is a question of both biography and history. The reason that Vernadsky's works would be so important is not only because he dealt with so many different things in a very unique way, but you would go

through the process of his own creativity. There were five books called *Problems of Biogeochemistry*, I think we translated two of them, which had to do with what Jason has been talking about with the notion of time and space.

There is a picture from the 1930s at a scientific conference, and on the one end is Vernadsky and on the other Albert Einstein. I don't know if they ever talked; they might not have, but those were really the two great figures of science in the last century. Vernadsky was inspired about Einstein's ideas, and he wrote about this, and it's not available except if you know Russian.

His last work was *The Chemical Structure of the Biosphere and Its Surroundings*. This is what Professor Pulinets was talking about, but he wrote that in 1944. If that would have been available, it would have been a tremendous boon to scientists and young educators and young people who want to learn science. Because they would be put right into the mainstream of science.

It's similar with LaRouche; his writings are still very relevant today. Look at our webinars and what we're publishing and the republishing of LaRouche's works. They are all very important today, even though he wrote 20 or 30 years ago. Because he was looking so far beyond, it becomes relevant for a long time, and this is the way to counter what both Vernadsky and LaRouche faced in the attempts to limit the proliferation and expansion of their ideas.

Ossenkopp: Well, LaRouche has always worked with young people, educating them and enlightening them to understand real science, as Professor Calabrese said in his presentation, "I'm old-school," he said. "I'm going back to the original sources. It's a double amount of work, but this brings you actually, and if you trace it today, this brings you to the original discoveries." That was exactly LaRouche's method. Now, young people are of course exposed to the system and how it undermines science and uses it for its own benefit.

We have a question which is very typical for young scientists, from a Venezuelan biologist by the name of César. I would like to address this to all of the panel, and to everyone who is involved with teaching and working with young people:

"Technological scientific development today is largely used only by the elites to make money, not in order to develop our human race. It is difficult for young scientists to develop science without being watched by interests seeking to steal any advance for their own benefit. Those of us who want to continue our doctoral projects are even cut off, and face the tough decision of having to abandon our work for lack of economic support."

He has a second question:

"How can a new world model be developed which supports science which serves to develop humanity beyond individuals seeking to profit from it? How can renewable energies and technologies such as nuclear energy be separated from their use as weapons instead of being an energy source for humanity?"

Prof. Battaglia: I wouldn't be so pessimistic. I think that human beings learn how to handle science and how to make profit out of it; I mean not only economic profit. So, I would be more optimistic. Of course, not everything that man does is done right, but it is part of our nature. Second, we should not think that to make profit is necessarily a bad thing. To make profit is OK, and this is eventually what human beings aim to, because making profit means also to be richer. Not rich in terms of money, but rich in terms of our ability of living better.

As for the separation of nuclear energy, everything that comes out of technology or out of science can be used in a good way or in a bad way. This is something that we should be aware of for everything we can think of. So, it is up to us to make the best use of it.

Jones: The idea of Vernadsky of an academy, that is, having a Manhattan-style project where the government is supportive of the decisions made to advance science, is absolutely essential today. That would resolve some of the problems here. It can't be a laissez-faire policy of developing science.

The United States has lived off of that since the end of the lunar program. It doesn't really lead to very good results. If we look at China, people criticize them because they made such great advances so quickly. They adopted the policy we had during that time. If we got back to that, you would eliminate many of these problems from the competition of the so-called companies—which unfortunately is becoming more the case today than less the case. Under the leadership of the national academy or the nation, you could see to it that everybody would be involved in this and benefit from it. It would not be a matter of competition in the market.

Prof. Pulinets: On the second part of the question: It is very difficult to separate, especially in nuclear science, military applications and peace applications, because the development of the technology usually wends in the way that inventions from military applications are transferred to peaceful applications. In Russia, there was a great problem with radioactive waste; what to do with it. It came from the production of nuclear weapons, but finally it produced a very, very strong advance in the peaceful nuclear reactors which are called fast neutron reactors. Their advantage is that they can use any kind of nuclear waste and there is no radioactive output. So, it is a most promising type of nuclear reactor, and it produces nuclear energy.

The decision on output depends on the intentions. If your government has a peaceful character, it will use these thoughts of the scientists in the peaceful way. But to separate, exactly, military and peaceful, you don't have enough scientists to work separately in this field. Thank you.

Ross: On the first part of our Venezuelan friend's question, I think that the issue of government direction for scientific progress and investment has been addressed here. The key thing there is, what are the goals of society? What are the economic goals that are put forward? If you have a free-market approach, you are going to miss investments specifically in infrastructure and in long-term scientific progress where the discovery of a fundamental law of nature isn't patentable, for example.

As we've seen with big projects like the Manhattan Project, like going to the Moon, you simply require government investment. And this should be the focus. We're spending huge amounts of money on really asinine projects—to make a windmill slightly better, this kind of thing—while people are fighting for dollars to make advancements in nuclear fusion, which is far more worthy of support. This is the goal of economics: What are the frontiers of science that are going to move things forward?

On the issue of nuclear energy and nuclear weapons, I'd also like to look back to the Strategic Defense Initiative policy, what was announced as the Strategic Defense Initiative by President Ronald Reagan in 1983. This came from a proposal that LaRouche had made on not trying to ban nuclear weapons, which I respect the intent of people who want to have a world free of nuclear weapons. The way to do that isn't by legislating away nuclear weapons, which can't happen. What LaRouche said is, let's develop a new technology rather than trying to control one that already exists in that way. Let's develop a defense against nuclear weapons, with new particle beams, with lasers, this kind of thing. That's one approach.

The other approach is changing the governments, destroying geopolitics so that there is not a fixed, zero-sum-game view of the world in which another's gain is your own loss. We need to put in place a system of cooperation, especially led by the U.S., Russia, China, India, and others towards adopting goals as a human society for progress, for the worldwide elimination of poverty, for big financing for the real frontiers of science. We have to adopt goals of this sort.

So, I don't think there's a technological answer to that question. It's inherently a cultural and a social one.

Ossenkopp: That brings me perfectly to the next question, which is from a gentleman named Frank Shü [as heard]. It's a longer question, but it also deals with an aspect of educating young people and the culture of science:

"How do we inspire the young people in North America and Europe to be interested in science and engineering as they were in the past, and as they are now in China? There was a recent survey where they found that the most popular dream jobs" in the West, I suppose "for children were, in this order: YouTuber/vlogger, teacher, then athlete, then musician, then astronaut. This is in contrast to China where the most popular dream jobs were, in order: astronaut, teacher, musician, athlete, and then YouTuber or vlogger." Secondly:

"The panel had brought up several problems, such as lack of resources in scientific and technological education, the promotion of a pessimistic outlook of humanity as polluters and as mere animals of the planet, among other problems. I would also like to point out that well-paying jobs in the tech industry are usually for software for companies such as Facebook, Google, and Amazon, or in finances, as opposed to physical engineering. What does the panel think we can immediately do on a policy and cultural level to advance the interests of productive STEM [science, technology, engineering, mathematics] culture in our societies?"

Ross: In the U.S., one thing not to do would be—there are some really insane attempts at education reform right now. One of the most notable is the Cali-

fornia math curriculum reform, which is not about math so much as seeking equity in things like this. This "reform" would remove advanced classes from schools in the name of making sure that people don't have too much divergence [in achievement] in their math classes or their tracking. This is idiotic, this is saying math isn't really the issue here, science isn't really the issue. So, don't do things like that.

In terms of really making a fun and enlivening STEM curriculum, I think if we look again to what Professor Calabrese said, that in his field what he would enjoy doing was going back to the original studies, the original works. Formulating in his own mind what experiments he'd think would make sense as follow-ups on that, he'd often find that those weren't what was done, and a different path was pursued. But, you need to look at the origins of things. I know that the educational curricula developed by Lyndon LaRouche, the LaRouche movement, and what I think makes sense would be to have a lot more of going through the original works.

So, take a curriculum and make the focus not understanding the application of formulas—I'm not saying they're wrong—but being able to do engineering effectively is not exactly the same pursuit as a development of a scientific capacity, that is, the ability to come up with new hypotheses to find where the problems lie in the current understanding. That's really what should be done in school. That's tough, it requires more teachers per number of pupils, but I think it's just a different approach that's actually fun. Do kids rediscover for themselves the Pythagorean theorem, or do they just use it? Do people hear that Kepler has three laws, and that planets move a certain way, or do they work through Kepler's well laid-out book, where you get to work through with him his discovery?

I know from teaching this way, that the kind of fun, comraderie, sense of each other's creativity, and ability to discover that comes among the pupils in that kind of educational environment, does something much more than pound into people the ability to do their math or physics homework right, although that would be a step up from where we are right now. But it really has a major social component as well, and it's fun. There's a real sense of love of what people are capable of doing, and a better understanding of the universality of people in general that comes from that.

There's a lot of division about what's your background, what's your identity, etc. Our identity as human beings is our ability to discover, and I think we could be doing a lot more of coming to know that universality of that human distinction from the animals. There's a great opportunity to do that with all the years that are spent in school, and I think we should take that opportunity much more.

Also, one other thing is having missions that put those skills to use. So, during the Apollo program in the United States, when we were going to the Moon, people went to school to study engineering. There was a clear mission, there was a goal there, there was a need for that kind of knowledge. If we have major goals on nuclear fusion, on space, things like that, that's the other direction of driving that kind of improvement in education.

Jones: What's going on in the world as a whole, of course, is very much different than what we have going on here in the United States. The big problem is that the U.S. is closing itself off more and more from the rest of the world in an attempt to actually become and remain the main hegemon. That has to do, for instance, with news coming from China. This could be inspiring—what the Chinese are doing on their space station, could be very inspiring for Americans.

I know the Chinese Embassy had one occasion where they invited schools to participate in Zoom at the embassy itself, to talk with the Chinese astronauts who were on the space station. People got very excited about it, but it's a very small group of people. Otherwise, you don't see anything about the Chinese space program on American television. You don't see the astronauts entering the new space station. If they could see this—people know this, the intelligence services watch it very carefully because they're so frightened of this.

But if it were made into a public phenomenon, if people could actually see what is going on in the rest of the world, they would again become excited about this, as the Chinese population is becoming excited about space exploration. But by trying to suppress it, and not letting the general public know what's going on, you're creating a closed environment in which we continue along the same route that we have been going along. Because the Chinese want to cooperate with the world.

In my presentation, I showed a map of the geological picture of the Moon done by the Chinese. We didn't do it, we didn't know all the geological information that's there, because we didn't have people studying it as intensively as Ouyang Ziyuan and his team. That should

be an inspiration for people of what the Moon really has to offer.

But, again, that is not known, because we're not going to talk to the Chinese because they're "bad people." That's the biggest problem. Both the Russians and the Chinese are going to recover from the crisis that we have now, and if we could open the doors again to the world, we would see that there are exciting things going on, and people would get excited about being a part of that.

Ossenkopp: Exactly! Well, science is universal. I can advise our viewers to watch female Chinese astronaut Wang Yaping's science lectures. She gave one from the earlier Chinese space station, and from the new one. I think she had an audience of 60 million students and teachers in China. You can watch them with English subtitles. You'll be very inspired, because they pose some questions. [For example,] how do you measure weight in microgravity? A simple question, but it's a real challenge for the mind and how it thinks.

This brings me to two questions, the first directed to Professor Battaglia, and the second for Professor Pulinets. They come from Cal Smith:

For Prof. Battaglia: "My wife and I recently returned from Napoli, Italy, where I had worked for a year. There was an abandoned nuclear power plant not far from our home, near Lago Patria. What potential exists in Italy to revive the attempted nuclear power industry? What was the role of the European Union in shutting down Italy's nuclear power industry?"

For Prof. Pulinets: "What additional work have you done on precursors of earthquakes and vulcanism?"

Prof. Battaglia: I think for the time being, and for a few years, it is difficult for Italy to return to nuclear power. There have been two referendums in Italy. One was the year [1987] after the Chernobyl accident, and that referendum was politically interpreted as against nuclear power, although it's not possible in Italy to have a referendum for or against nuclear power because it is against the Constitution. However, politically the referendum was interpreted in that way.

Then, we had another back in 2010. The government at the time was Prime Minister Berlusconi, and he was for the revival of nuclear power in Italy. However during that time there was the Fukushima accident in Japan, which was interpreted as a nuclear accident. Actually, there were a thousand people dead because of the flooding, but nobody even got a cold from the radiation that came out from the Fukushima reactor.

However, Italy had another referendum at that time, and because of the Fukushima accident, Italians gave their vote against nuclear power again. It was quite strange because Italy is the only country in the world to shut down its nuclear power after Chernobyl and Fukushima. Only Italy. After Chernobyl, in Ukraine there were nine new nuclear reactors. And Japan is coming back again to repower with nuclear energy. So, the Italian situation is quite strange.

The question actually suggests that there has been some influence from other European countries, so that nuclear power would not be part of Italy's energy production. This could be, I don't really know what kind of influence from abroad has been against nuclear power in Italy. But I think eventually Italy has to rethink its energy policy, because at the time being, it's quite a failure.

Prof. Pulinets: Instead of answering the question, I'll try to screen-share the covers of two monographs, two books, regarding what I am doing. The green one, *The Possibility of Earthquake Forecasting; Learning from Nature*, was published in 2018, by the Institute of Physics in Great Britain. It was co-authored with Dimitar Ouzounov from the United States.

The second book, *Earthquake Precursors in the Atmosphere and Ionosphere: New Concepts*, is already with Amazon, but it is not yet physically published. It is promised to be published in July this year by Springer.

We put our latest results on the possibilities of forecasting, especially with the help of space technology applied to the registering of precursors in the atmosphere and ionosphere. So, if you can send me email from the person who put the question, I can send him a link to the majority of my publications as PDFs. He will be able to download them. This is my answer.

Ossenkopp: We will make sure that Cal Smith gets access to these publications.

We do have a question that is related to Mr. LaRouche, who was a universal scientist, not just in economics. He was interested in all fields of science, and the question is about his relationship and collaboration with the Russian Academy of Sciences. This question comes from Amber Smith, a volunteer for the Sare for Senate campaign in New York.

"Can you describe or elucidate LaRouche's

influence and collaboration with the Russian Academy of Sciences, and what caused him to be elected as a corresponding member of the International Ecological Academy (lEA) of Russia?"

Jones: I think it was obvious why he was elected, because they immediately recognized the quality of his ideas, the quality of his mind. It's not unusual that they did. He was also recognized by people here, but he was under an intensive campaign; millions of dollars essentially were spent to really paint him as a criminal or a whacko, or whatever. But in Russia, that was not the case. They looked at the ideas, and they saw complementary ideas to many of the things that had been already expressed in Russian culture, in particular, the ideas of Vernadsky.

Actually, one of his strongest supports was Pobisk Kuznetsov, who was the one who said that LaRouche's definition of economic development in terms of increasing energy-flux density should be called the "la" [that is, the unit thereof —ed.] in honor of LaRouche. Pobisk was also on the commission in Russia to investigate the heritage of Vernadsky. So, there was a greater understanding of what he was actually saying among Russian intellectuals, than unfortunately with many American intellectuals who tended to be much more pragmatic and didn't have the long-term vision of LaRouche. I think that was quite an obvious thing.

And politically, of course, LaRouche was favorable to U.S.-Russia relations, and he was working as a back channel for a part of the Clinton administration to try to improve relations with Russia in the 1990s. Of course, that was sabotaged by Al Gore, who unfortunately became the point person in Russian policy for Clinton, so LaRouche's influence was not as great. But that's what he was doing in Russia. He was doing that, not as a private citizen, but as a representative of the United States. It was really the power of his ideas that led to his being elected to the Academy.

Ossenkopp: Sergey Pulinets, do you know anything additional? Another aspect of this?

Prof. Pulinets: I met Lyndon and Helga LaRouche in a few conferences which were organized by the Schiller Institute. I started to know about their activity and their ideas only from these conferences. After that, I was looking at what were the ideas of LaRouche in Russia. I know that they had a conference in Dubna University, mainly politics. A part of the humanitarian part of the Russian Academy of Sciences was involved in this cooperation with Lyndon LaRouche. That's all I know from my side.

Ossenkopp: For those of you who are not familiar with Lyndon LaRouche's works, there is an opportunity to purchase the first volume of his *Collected Works* from the LaRouche Legacy Foundation. When they are finished there will be 100 or 200 volumes. Mr. LaRouche passed away in 2019. His birthday was September 8, 1922, so I think on September 8th of this year, will be his 100th anniversary. Stay tuned also for a conference or some other of our activities.

Now, I would like to bring up a question which has been contended for decades, which is fusion energy. We've talked about this, and also LaRouche established the Fusion Energy Foundation and *Fusion* magazine. I think it's very fitting to ask the following question from Corky G.:

"Is the Schiller Institute aware of the continuing work on cold fusion? Ball lightning physics carried out by Russians and others. For example, the SAFIRE project is far ahead of the ITER."

Ross: I can say a bit. Our understanding of the [atomic] nucleus is not complete. The potential and the existence of low-energy nuclear reactions definitely deserves more research. I think it's exciting that there are projects that are looking into the possibility of there being aspects of nuclear transformations that we don't fully understand yet. Then that kind of work should continue. But I don't have a specific piece of feedback on the SAFIRE project.

Ossenkopp: Professor Pulinets, do you know anything about this?

Pulinets: Russia participates probably in all projects regarding nuclear fusion. I spent, I would say, more than 30 years in the science city of Troitsk, where there was and still exists the TRINITY Institution [the Troitsk Institute of Innovative and Thermonuclear Research] which worked as a part of the Kurchatov Institute. It worked actively in creating the tokamak and the scientists there are an authority on the tokamaks and other heating methods of the plasma, and so on. But I personally do not participate in this. I know only that the periods of enthusiasm, and the opposite side, change year by year, and still it is not clear when the really long-

term confinement of hot plasma will happen, which will start the nuclear reactor activity in real life. This is the first part.

The second part: about the ball lightning. Just again returning to the Troitsk Scientific Institute, there is an Institute of Terrestrial Magnetism, Ionosphere, and Radiowave Propagation, which works in radio physics. During my last years of working in this Institute, I was a deputy director of the Institute of Terrestrial Magnetism, Ionosphere, and Radiowave Propagation.

Professor Stakhanov was there, who wrote the book about ball lightning. He passed away very early, but it opened the way to study ball lightning. There now is a large community studying ball lightning. I participate from time to time in these basic specific seminars in Moscow University about ball lightning. The seminar is named the Ball Lightning Seminar. They demonstrate many experimental results of research of ball lightning. There are some active experiments to generate artificial ball lightning. So, it is full of life on this problem in Russia, but still not the final answer on the physical mechanisms of ball lightning generation.

Ossenkopp: I want to ask Bill if you know anything about what the Chinese are doing in fusion energy. What I heard is, they want to have this technology applicable…

Pulinets: [interrupting] I heard that they achieved the longest time of keeping the hot plasma. So, they have the largest progress in the solving of this problem.

Jones: That's exactly the achievement they have made. They're putting money and energy into this. Obviously, they made the decision a long time ago that this was going to be a major effort on their part. They're big in the ITER project; they have two nuclear fusion reactor projects as I understand it, one at the Hefei Institute and the other at Chengdu.

Of course, the whole space program—which is to mine on the Moon—is also oriented to mining helium, which would be a source for the fusion reactors.

The decision [to mine helium-3 on the Moon] was made a long time ago. It had a lot to do with Ouyang Ziyuan, the geologist who pushed the space program at a very early stage. At one time, he was like Werner von Braun here in the U.S. in making it a public issue. That is the orientation. They're going to the Moon for the resources. One of the major resources is the helium. They intend to have fusion energy by the time they are at the point where they can start mining the helium-3 on the Moon.

China's space program is oriented to mining helium-3 on the Moon, which would be the most desirable fuel source for advanced fusion reactors.

So, it's big-time with them.

Ossenkopp: Yesterday, we had a panel on the utter bankruptcy of the financial system, and that it has to be reorganized and investments have to be turned toward breakthroughs in scientific research and not into speculation. I have a question that goes in that direction, because there was a call issued by the Schiller Institute's President, Helga Zepp-LaRouche, to collect thousands of signatures worldwide to mobilize for a New Bretton Woods conference to reorganize the financial system and get rid of the speculative casino. Renée Sigerson suggests that we also bring in this aspect:

"That document, the proposal that we are making in the Schiller Institute, should reference the destructive effect of the dictatorial imposition of the fairy tale of global warming and CO_2 paranoia as scientific ideas, and demand as a component of the reorganization of the financial system that a worldwide debate on that matter be opened up. After all, the question of where investment goes—in industry, in science—is where the rubber hits the road."

Pulinets: Recently, Russia started to transform the financial system, as you know, making the Russian ruble the most reliable currency now, and growing. The big grounds for this is that the financial system should ground its loans on the resources and material industry of a country, rather than on some services which do not have a real result in the real program. Probably to transform the system from banking to industrial finances will transform the economy, and the first steps have been done already.

Ross: As far as making a New Bretton Woods a new financial architecture for the world, you do have to choose goals for what the development will look like. I think that having an anti-Malthusian, or anti-Green goal (in the sense of the Green pseudo-religious ideology) as a component of that, makes sense. Because the same networks that promote warfare, the encirclement of Russia and China, the geopolitical confrontation with those countries—these are same networks with an

enormous overlap with the City of London, Wall Street, Washington, NATO.

Between economic financialization, which we've seen really destroy the physical economic productivity while increasingly financializing it, the Green anti-human Malthusian ideology uses claims of global warming and catastrophic changes and so on, usually presented without the context of what it would take to protect humanity, even if these changes were to occur. It's sort of a religious belief that change is bad. The financialization of the economy, the Green ideology, and warfare, especially regarding Russia and China—these are basically all three sides of the same intent. It's important to recognize that you can absolutely shoot yourself in the foot if you say, "Hey, we need a new world system, what we have right now is unjust, it's not oriented around development, around eliminating poverty." But if you then lock yourself into a Green outlook, you are not going to be able to achieve those goals.

So, I think that makes sense to consider that as part of the perspective of what a new system is that we need.

Jones: If you have a New Bretton Woods conference, the idea should be different than the old Bretton Woods, in one sense: You have to institute this notion that President Xi has been calling the win-win cooperation. Because each nation has different requirements and different needs. They are sovereign nations, and they would come together in this kind of a conference. It can't be decided—you can't figure out initially. You can set the goals for where the world should go, but then you have to take consideration of the individual problems that exist within each nation; and they're much different. They're much different because of culture and other requirements. So, you have to find a principle which will bring everybody together.

I think this idea of the win-win cooperation, or the community of a shared future, should be the basis for any kind of discussions of this nature, in order to be able to incorporate all the various needs of each of the individual countries. I think they will make the decision in terms of what benefits their populations. This is the second criteria that has been pointed out by Xi—the people-centeredness of the decisions being made, must also be a requirement for any kind of discussion.

Of course, Xi's proposed Global Development Initiative has been accepted by the United Nations, so that could be a format for beginning to talk about the idea of a New Bretton Woods system in the context of how we actually develop the world as a whole toward this development initiative.

Ossenkopp: I have several questions directed towards Jason. This one is from Linda Everett:

"Decades back, you interviewed many international scientists, presenting their research in all fields of science, from the cooperative effort of many countries through satellites to predict storms, volcanic activity, and the danger of asteroids. No doubt, scientists are still working, but now possibly only in a controlled environment. Thus, the capacity to share and develop ideas is horrifically eclipsed. Please, would you address this?"

Ross: I might offer an amendment on the timeframe there about decades ago [laughter], but I think that conferences like this one are important for being able to bring together scientists and people from different backgrounds to have a sense of how these different fields of research can come together in advancing the aims of the human species. With that intent being a clear part of national policy overall, I think we would end up with a lot more of that. There's a sort of silo effect that occurs in academia, where researchers become quite focussed in a particular field, and sometimes lose out on opportunities to present with colleagues working in other fields, or even people from different walks of life, people who are involved in making policy, or making economic decisions. There's not enough of an understanding between these areas.

So, you have the trouble of economists who think in terms of money, or GDP, this kind of figure, but don't have any real understanding of science from the inside. That's a terrible problem. Then, you also have scientists who could make great contributions toward these broader social issues, and who maybe simply aren't being asked; their opinions are not being solicited.

I think it comes again to the issue of mission, for nations individually, and for the international community, through adopting broad, bold missions in science, in economics, for development, that I think will be able to get and drive a greater degree of collaboration. That would be something of great benefit.

Ossenkopp: You brought up the word "mission." This is a perfect key word for a question that came in from Pat Salisbury, who says,

"There has been some discussion of the importance of defining science missions and looking into the great discoveries historically of scientists like Kepler to inspire youth. But we also have the image of Einstein playing his violin and his comments as to where *his* creative inspiration originated. Are there any lessons in that direction for us in our efforts to spark a renaissance?"

Pulinets: What kind of renaissance do you mean? [laughs] I cannot compare myself with Albert Einstein, but I can say that I compose songs and poems; it inspires me in my scientific work, and I know many physicists in Russia are doing in the same way. Even in the 1970s, there were discussions between physics and lyrics. Physics won because there were similarities with physics and lyrics as well.

Ossenkopp: OK, Bill, because that connection between poetry, Classic music, and scientific discovery is something that also startles you.

Jones: The issue is aesthetic education. The famous educator, Cai Yuanpei, who travelled to Europe in the early 1900s, went to Germany, and was educated there for about four years, studied the development of philosophy and education, but also learned how to play the piano and the violin. Neither the piano nor the violin were Chinese instruments to any extent.

He went back to China, and became Minister of Education under Sun Yat-sen. But in a very short period, Sun was out.

He instituted what he called "aesthetic education," because he said that what he had learned, also from the study of Schiller's writings, was not to be ignored. What he came across in Germany was Schiller's *Letters Upon the Aesthetic Education of Man*, which he also, I believe, translated into Chinese, or had translated into Chinese. Because he followed the view that you want to cultivate a moral attitude in the individuals; it's true, the concept of beauty, through striking the chords within that individual, represents the highest strivings of the individual, the highest capacities of the individual mind.

So, he said that this should be a part of general education, whether you're going to study politics or history, or science, you have to have an aesthetic base for doing that. You study a musical instrument, you sing. These were things that were going to become universal within the society, because they improve the moral character of the individual, and they inspire the creativity.

I think that has to be kind of a program of any kind of Manhattan-style program. To push the STEM has to be connected also to a program of aesthetic education that is open and maybe mandatory to some extent for everybody, which it is in China. They realize the importance of this for inspiring creativity.

Ossenkopp: We should wrap up. I'm really grateful for this very inspiring discussion. Thank you to Professor Pulinets in Moscow, to Bill Jones and to Jason Ross in the U.S., and thank you to Professor Battaglia in Italy, and Professor Calabrese in the United States. Thank you all for your contributions.

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