Dr. Sergey Pulinets

Are Earthquakes Foreseeable? The Current State of Research

Professor Sergey Pulinets of the Fyodorov Institute of Applied Geophysics, Moscow, addressed the Schiller Institute conference on July 2, on Panel 2, "The Preeminence of Science over Ideology." He is a leading researcher on earthquake precursors, a field which is outlawed by the global science establishment, on the absurd grounds that forecasting earthquakes is impossible and will always be impossible.[1]

We provide here a synopsis and excerpts from his remarks. He used a slide presentation to document his case; we will reproduce some of these graphics in a future issue, with the full speech.

Pulinets said that he would mainly discuss the processes that are connected with the ionization of our atmosphere. "Actually, we have two main sources of ionization, natural sources: The first one is the ground; it is the Earth's radioactivity. We know that the Earth's crust contains uranium, and the products of uranium decay, and especially the gaseous product, radon gas, are released everywhere."

EIRNS/Juline Lemaitre

Dr. Pulinets addresses the conference on July 2. He and a few collaborators are working on breakthrough material without funding; they are in urgent need of financial support to set up a small international center to monitor earthquake precursors.

The main source of ionization of the upper layers of the atmosphere is galactic cosmic rays, "which penetrate to our environment, and bring about very strong change, including climate change."

He then described how this ionization works on the water vapor in the atmosphere. If charged particles collide with a neutral molecule of gas, a positive ion is released; and free electrons can be attached to a neutral particle, forming a negative ion.

How is liquid water converted into water vapor? It requires additional energy, known as "latent heat." And this latent heat, he said, plays a role in many processes in our environment, notably the formation of clouds.

But in all the scientific literature, Pulinets said, "practically nobody takes into account another process—the latent heat exhalation during this process. Everybody looks only at the particle formation in clouds. But, together with the formation of clouds, we have also the positive effect in the level of the tropopause—this is the level between 10 and 15 kilometers, which is continuously heated by the release of latent heat."

The variations of global heating, galactic cosmic rays, and other processes, have different periodicities. We have the 11-year solar cycle, and we have the Forbush effect, which lasts only one or two days, during geomagnetic storms. "All these periodicities were discovered in the variations of the global temperature of our planet," Pulinets said.

"And probably you have heard, and you feel yourself, that our climate and weather have become very unstable. So, we have oscillations of the weather, to more extreme conditions, from higher to lower temper-

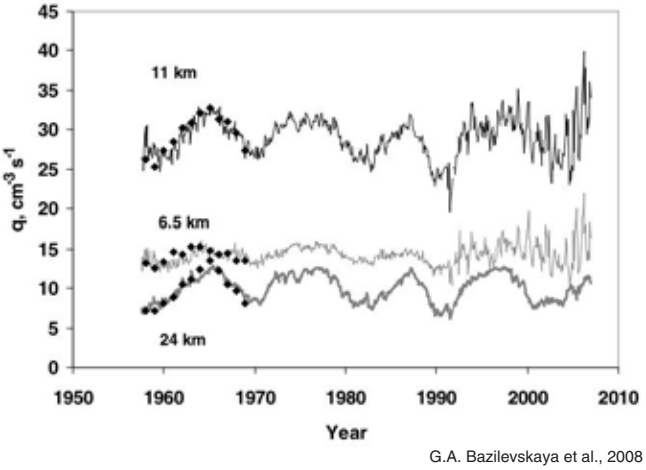
1. See interview with Pulinets, "A Multi-Parameter Approach to Earthquake Forecasting," *EIR*, April 22, 2011; video at http://www.larouchepac.com/node17944).

atures, high winds, cyclones. And here [**Figure 1**] you can see how the variability of the production of ions has increased during the last decades; probably this is one of the reasons for such variability of our climate.

"And this [**Figure 2**] is a very beautiful example: People made measurements underground, registering the secondary cosmic rays, and correlated these with the temperature in the level of the stratosphere." The red line on the graph shows the temperatures during the Winters of 2003-04, 2004-05, 2005-06, and 2007, and the blue line shows the fluxes of secondary galactic cosmic rays (muon rate). The correlation is so close that you can hardly see the blue line under the red one.

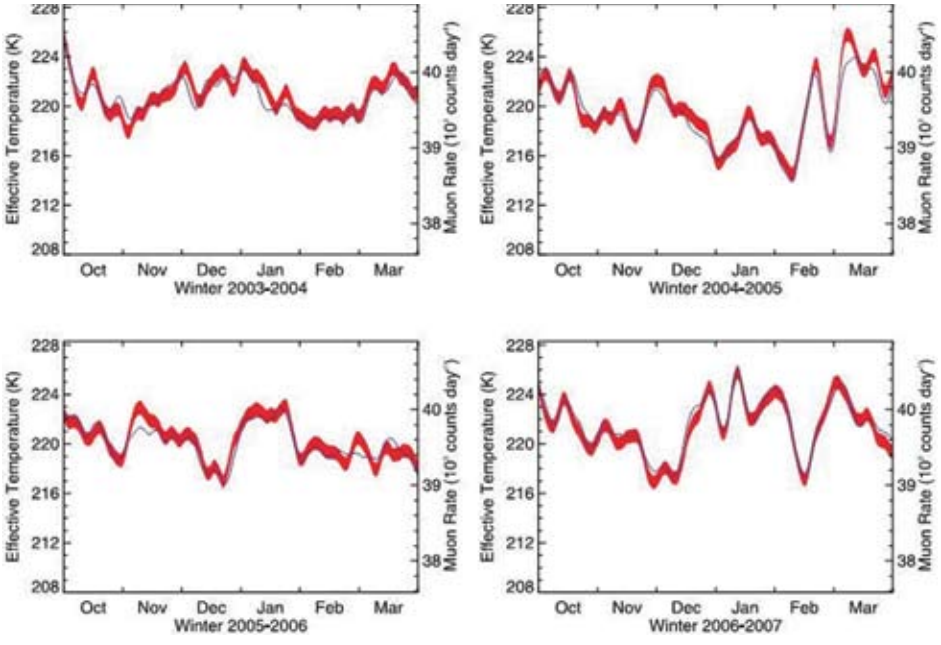
"And it was a surprise for me," the speaker said, "how strong the role of the latent heat is. If we take the total balance of the thermal energy of our atmosphere, only 42% is provided by direct heating by the Sun; 48% is dependent on the changes [in latent heat]—the dew in the morning and evening; and the daily transformation, evaporation, and condensation. And the daily variations of temperature are 48% dependent on this transformation in the latent heat."

FIGURE 1
Increased Ion Production Rate in Recent Decades



G.A. Bazilevskaya et al., 2008

FIGURE 2
Short-Term Correlation of Temperature in the Stratosphere and Secondary Cosmic Rays



Scott Osprey et al., 2009

The thick red line shows temperature; the thin blue line shows cosmic rays.

Earthquakes

Pulinets then went on to the subject of earthquake forecasting. "I have seen a very interesting presentation on the LaRouche television about the Ring of Fire,"[2] he said. "I would like to demonstrate for you how it works."

He blasted the attitude of the science establishment in this regard: "When people tell you that it's impossible to predict earthquakes, that it is stupid to try—you cannot imagine! Even if you want to make a nuclear bomb, there are precursors! It is organized someplace where it is produced; you hire the people. And you can track all these processes before the production of this bomb! The same with an earthquake: Such huge amounts of energy are released in one moment, that it is impossible that the Earth does not manifest *anything* beforehand!"

Pulinets and his collaborators' approach uses physical precursors. Earthquakes have different periodicities, he explained, "but for strong earthquakes, this periodicity is from 30 to 70 years, and we are looking at the last stage, which is a few months, a few weeks, before the

2. LaRouchePAC video at http://tiny.cc/xb9rg

earthquakes. There were several parameters that were monitored by the United States, by the Soviet Union, and other countries, in the 1970s and '80s, and there was great hope that this problem would be resolved.

"But after a few failures, in '96-97, there was a discussion in the journal *Science*; the leader of this discussion was a professor at Tokyo University, Robert Geller. And seismologists decided that prediction is impossible, and it was prohibited in scientific literature to use the words 'earthquake prediction'! The scientists were punished—it is really so!—the scientists were punished for using this term, and their papers were not published, especially in the *Journal of Geophysical Research*, or *Geophysical Research Letters*, the *Bulletin of the Seismological Society of America*, and so on.

"Fortunately, the situation is now changing. In 2005, simultaneously in the United States and Russia, the councils were reestablished that are analyzing the different kinds of earthquake prediction. But still, we are in a situation where the majority of the seismological community claims that it is 'impossible.'"

The model that Pulinets and his collaborators are developing uses measurements of relative humidity, changes in latent heat, outgoing long-wave radiation, electron concentration, and other factors. He used the example of the Gujarat earthquake in India (2001) to show that the heating of the area exactly corresponded to the location of active tectonic faults.

"So you have a lot of parameters, a lot of anomalies in the atmosphere, which could be measured, and all of them appear in the same place, almost at the same time, within the period of between two weeks and a few days, before the impending earthquake," he stressed.

Future Prospects

Concluding his discussion of earthquakes, Pulinets said, "Now you will ask me, 'If you are so clever, why don't you predict earthquakes?' The answer is very simple: If you have, for example, a fire in your house, and you are by yourself, it's very difficult to fight it. You call for the firemen. There are a lot of emergency services. A special service should be created [for studying earthquake precursors]. My friend and co-author Dimitar Ouzounov, who took all the thermal measurements—he lives in the United States, and I live in Russia. But to make predictions, there should be people who are sitting around the clock and analyzing information in real-time. At least some group should be created, to perform this service.

"We have zero financing for our research. Everything I've demonstrated was done in the course of our ordinary activity, with no financing. To be successful, we need to create at least one laboratory, and direct it; it will have a few young people, because all this data processing is time consuming. We sit at the computer after a strong earthquake, and try to get information from all over the world, taking the atmospheric parameters—but we have no direct channels to immediately get the information on the air temperature in Japan, in Sumatra, and so on; the humidity; to download the data from satellites; GPS calculations—all this needs special infrastructure. Until it is organized, this problem will not be practically resolved."

After discussing the relevance of his research to hurricanes, radioactive pollution of the environment, and the question, "Can we do something about the weather?" Pulinets summed up the presentation as follows: "We should take into account the ionization processes in different areas, and we see that they are connected with climate change, with the detection of earthquake precursors, with activity of tropical cyclones and hurricanes; and there exists the possibility of effects on the weather, and somehow, sometimes, we can correct the weather."

And finally, he offered his broader perspective:

"I would like to say a few words also about modern science. Unfortunately, we have very narrow specialization. People know only their own field very well, and if something goes on outside of their field of knowledge, it is impossible to talk with them, because they do not understand, and their reply is, 'I do not believe.' We are not in church, where you should believe! We are doing science.

"So I think that we should develop—I call this a "holistic approach." We should raise up scientists who have knowledge in different fields, because for this work, you need to know the physics of the atmosphere, the physics of plasma, the chemistry of the atmosphere; atmospheric electricity; thermodynamics, and many, many other things. If you are not able at least to understand the basics, you cannot make progress in such matters.

"And this is an issue of our conflicts, for example, with seismologists: They do not know the physics of the ionosphere. They do not know well, the physics of the atmosphere. But, when the word 'earthquake' appears in the literature, or in discussions, they say, 'We are responsible for this. Get out of this field.'

"This is a problem, and we should resolve it. We should explain that an earthquake and its preparation is a complex process: It envelops different geospheres which interact. And here we come to the conception of Vernadsky: that all things in our planet are connected, one to another. We should keep this in mind and work carefully to understand our planet."