

# EIR Science & Technology

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## The mission of the 'Academy of the 100'

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*EIR interviews Wolter Manusadjan and Taras Muranivsky, leaders of the International Ecological Academy, founded in 1989 by a group of scientists, including veterans of the Soviet space program.*

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*Prof. Wolter Manusadjan is co-founder and president of the International Ecological Academy (IEA), known as the Academy of the 100. (EIR, on Oct. 29, 1993, reported on Lyndon LaRouche's election as a corresponding member of the IEA.) He is also director of the Scientific Research Institute "Med-informpribor" of the A.S. Popov Russian Scientific-Technological Society for Radio Engineering, Electronics, and Communication. Prof. Taras Muranivsky, who is on the staff of the Russian State University for the Humanities, is vice president of the IEA. Professors Manusadjan and Muranivsky were interviewed by Rachel Douglas on Dec. 11 in Germany, where they attended a conference of the Schiller Institute. The interview has been translated from Russian.*

**EIR:** Professor Manusadjan, please tell us about the creation of your Academy. What kind of organization is this, and how did it come into existence?

**Manusadjan:** Our Academy was founded on May 17, 1989 in Tallinn, Estonia. It was created by a large group of scientists from the U.S.S.R. Academy of Sciences, the Academy of Medical Sciences, and the Ministry of Health. These were scientists working in various areas of space research, and science-intensive advanced terrestrial technologies.

It is a strictly professional academy. It does not set goals of the sort pursued by populist movements, like the green movement—such as environmental protection. We see our basic goal and task as the development of technologies that are compatible with nature. In a special declaration of ours, there is a point called "Humanization of scientific and technological progress." By humanization, we mean progress that does not automatically destroy the environment; not because you ban something, but because you apply compatible technology.

I'll give a concrete example. Metallurgy has always entailed high temperatures. Temperatures of several hundred degrees Celsius, and sometimes even higher—a thousand degrees—were required for metallurgical processes to occur. But there is such a thing as bio-compatible low-temperature metallurgy, which takes place under ordinary conditions. When nature develops, it does so without high temperatures; it develops within well-defined physiological ranges of temperatures.

For such purposes, we of course needed a professional association of scientists. Individual scientists have such a concept of the progress of humanity, but political authorities, political forces, do not. Even the Ministry for Environmental Protection deals more with, say, the reduction of toxic substances, poisonous wastes, by-products of agriculture like fertilizers, herbicides, and so forth.

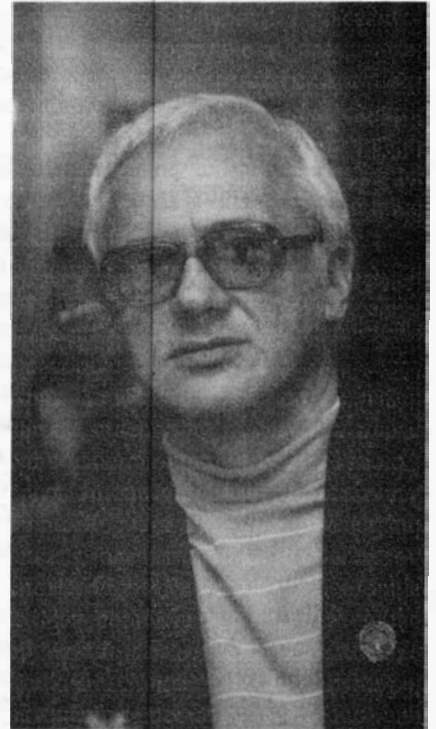
Our task is somewhat different. It's purely scientific. First of all, what research is the most important to carry out, in order that the progress of mankind might continue 100 years, 200 years, 300 years, and, ultimately, that life—this highly organized matter—remain on earth? Only professional scientists could address this task.

Therefore, our Academy is a unique phenomenon. I would like to elaborate on its unique character. We studied the experience of all the academies that ever existed, beginning with Plato, with that grove of Academe in Greece, which existed more than 2,000 years ago. This experience showed the necessity of incorporating certain very important principles into the basis of our Academy, in order for it to be effective.

One of these principles is that the entire collective of scientists, the creative audience, so to speak, of the Academy, be independent from the government. The overwhelm-



*Prof. Taras V. Muranivsky (left), vice president of the International Ecological Academy; and Prof. Wolter Manusadjan, co-founder and president of the Academy (right). Also known as the "Academy of the 100," the IEA was founded in May 1989. Lyndon LaRouche was elected a corresponding member in 1993.*



ing majority of academies in the Middle Ages were commissioned by kings, by people who had great power and authority. An exception was one of the first academies that arose in Naples, Italy—Accademia de Lincei. It was also in Florence, where several academies emerged, and it was named the Academy of the Lynx-Eyed, that is, those who see nature very sharply. That Academy of the Lynx-Eyed was composed of just seven people. They created an academy. It didn't exist for very long, 20 years or so, but it did exist, and then disappeared. After that, a second academy was created on its foundation; the Medici restored it. The academy movement became fairly systematic in Italy, but again it turned into a government movement.

The problem is, that when scientists begin to serve the government, they no longer constitute that healthy opposition, which is able objectively to see social processes and the practical implementation of science. They are always working *for* somebody.

In this respect, I even see some similarity between the LaRouche movement and our Academy. These are independent movements. I believe that wise rulers should permit the existence of independent movements. They shouldn't be nervous and try to get rid of people who are out of stride, but rather be capable of hearing them out, because from among them may come that step into the future, which otherwise would be missed.

But let me speak in more detail about our Academy. Who created it? It was created by scientists who acquired great and unique experience during their work on developing space

technologies. Thus, this Academy has brought together scientists who enjoy great authority.

One of our first presidents, for example, was Academician Ivan Akulinichev, who essentially founded space electrocardiography. You know the importance of electrocardiography; when you go to the doctor, the first thing he does is to take an electrocardiogram. Now, you can take an electrocardiogram by telephone. The patient puts the sensing elements on, and, as the reading is taken over the phone, it can be determined immediately if he is in a pre-infarction condition and needs medical assistance.

Akulinichev received the Christopher Columbus medal for humanism in science.

**EIR:** Is that an Italian award?

**Manusadjan:** There is a Swiss-Italian university, which also has an academy group attached to it. Very few of our people received the Christopher Columbus medal: The cosmonaut Yuri Gagarin got this award, as did Academician Keldysh, who was responsible for the entire theoretical mathematical side of the space program. Academician Akulinichev is the only one left. He is an older man. He had a double education, in medicine and technology.

So we have consolidated a group of scientists who I believe possess a very good quality: independence, and integrity. These are not scientists you can twist around your thumb and order them what to write, and they'll do it. These are scientists capable of saying something independent. They may not say anything. But if they say something, they usually

express original thoughts.

Another principle we incorporated is that our Academy does not aim to become very large, to collect material means and then not know what to do with them.

**EIR:** The upper limit on membership is 100 people?

**Manusadjan:** This is the ceiling on the number of full members of the Academy. But so that our academicians not stay too long, that nobody be a member of the Academy for reasons of ambition or because he simply likes to collect titles, we have a special rule, that if a member of our Academy agrees to become a member of another academy, then he becomes an extraordinary academician, which means a former academician, or ex-academician of our Academy. This way, a member will be working in a collective of people who are not out to amass titles. This is very important.

**EIR:** What if someone is made an honorary member of another academy?

**Manusadjan:** He moves to the status of extraordinary academician in our Academy. It doesn't make any difference, because to be even an honorary member of an academy presumes your participation, and you can't be married to three wives at once.

If I, for example, were invited to join the Academy of Natural Sciences, I would never join it, because it is enough to concentrate in one area. One shouldn't flit from one thing to the next.

We have had nuclear physicists. We have had specialists in space medicine, and people whose profession was ecology for many years. One of our co-presidents is Professor Martyn, an Estonian, who was the director of the Botanical Garden in Estonia. Together with some other ecologists, he published a several-volume work in America, on the ecology of America, especially Alaska, Canada, and so forth. So these are well-known people in the area of ecology. They might not be the ones who become "generals" of science; many of these people received many votes for membership in our Academy of Sciences, or other academies, but because of their non-conformist character they did not join, because any academy is limited by its composition.

While other academies seek material support, the goal of our Academy at the present stage is the creative exchange of ideas. Creative exchange makes it possible to advance rapidly and to find completely unexpected solutions, which it is difficult to find in some separate or monolithic collective.

Some of our full members are forming a division for the humanities. We have professional political scientists, who know politics, led by Prof. Yevgeni Bazhanov, pro-rector of the Diplomatic Academy of the Ministry of Foreign Affairs of the Russian Federation. We recently elected him a full member of our Academy. We have Dr. Kravchenko, who has been working for many years on politics, ecology, social movements, and so forth. He was trained as a historian.

He knows economics, but also such important matters as journalism.

This is all united under the rubric of Social Ecology. We have broadened this concept somewhat, and turned it into the Ecology of Society. We know the traditional lines of scientific work, like the Ecology of Man, the Ecology of Food, the Ecology of Habitat. We're not talking about some movement calling to destroy machines and so forth. It would be strange for a professional scientist to go around destroying what he has created. He's not going to do this, but he may find technical, scientific, and technological solutions that will be more humane, in that they will free people from tedious labor, which exhausts them and leads to their losing their human qualities and turning them into cogs in a machine.

The term "humanization of scientific and technological progress," therefore, is a philosophical term. Our basic principles are philosophical ones. When you look into it, you find that we have formulated these things in a non-traditional way.

**Muranivsky:** I would like to add a conceptual aspect here at the outset, which is that the goal of the Academy, as it is formulated in our founding documents, has a lot in common with the ideology and principles of the science of Physical Economy, and an orientation to the acceleration of scientific and technological progress. This touches on something that Lyndon LaRouche particularly stresses in *The Science of Christian Economy*, namely, that the development of society, and its future, depend on fundamental scientific work.

**EIR:** We wanted to ask you about this, because when people talk about "ecology" in the West, it often implies opposition to scientific and technological progress. But you are saying something quite different.

**Muranivsky:** Quite different, indeed. We are not on the same track as the greens. We are not on the same track as the Club of Rome was in the 1970s, when they proclaimed *Limits to Growth*. We do not share points of view oriented to stopping scientific and technological progress as such and opposing the development of the means of production, that foundation of foundations of production itself. We do not share the idea of the post-industrial society, which LaRouche writes about. We see the progress of humanity and society, its development, in the development of fundamental scientific work and scientific and technological progress.

**Manusadjan:** I should make a very important correction here, because otherwise readers may be confused. This Academy has not adopted LaRouche's views as some kind of absolute. It would be incorrect to present matters as if this were a LaRouche movement. Moreover, we have seen that there are some American scientists, with whom we have already conducted talks, who sharply oppose LaRouche.

But we believe that it is necessary to have an opposition. To put it even more strongly, scientists holding opposing views should hear each other out. This is a different matter.

I do not support Taras Vasilyevich 100%; I support 99% of what he says. But that 1% is our right. We see much in LaRouche that is interesting. We know perfectly well that no scientist can state the absolute truth. A scientist is not God, and no person, in general, can state the absolute truth. But an independent opinion, which often may not coincide with the opinions of other members of the Academy—this we have.

When we elected LaRouche, this was not a simple process. We wanted first to know more about his movement.

**EIR:** It would be good to hear about this in the context of the current work of the Academy. We are interested in the election of LaRouche in October, as well as what the rest of the agenda of that session was, and what members of the Academy are working on now.

**Manusadjan:** You mean, how will work proceed from here on? We have several things under way. I won't enumerate all the members of the Academy who are from the United States of America, but on the question of the Ecology of Society—we all live on the same planet. For better or for worse, but we must be able to live in a stable, conflict-free fashion. Even if you have a view diametrically opposed to somebody else's.

Let me say it so that I think it will be understood: I believe that the socialist and the capitalist must be able to live together. Some questions should be decided not through conflict, but rather by the means just mentioned by Taras Vasilyevich—by the productive forces.

On the question of whether the surplus growth of mankind can be infinite or not—

**Muranivsky:** —the neo-malthusian teaching.

**Manusadjan:** I won't call it that, because any theory, if it is linked with somebody's name, in my opinion is always a narrow form of theory. A Newtonian theory of physics does not exist; mechanics exists, to which Newton made a contribution. Leonardo da Vinci lived, but we don't talk about the Leonardo da Vinci movement or theory, because science is an objective process and there should be things there which don't lend themselves to personification. The minute you start to personify things, you're into social psychology. Many people only understand processes if you name them concretely.

And I think this is an important aspect, so that we may attract to our Academy scientists who might sometimes have diametrically opposed views, and thus show how, nevertheless, collaboration must be maintained—and maintained, moreover, on the basis of ethical principles. When LaRouche was nominated, we had to take a very close look at some things in his works. We have top mathematicians, people who are among the top ten mathematicians in the world. Prof. Lev Meshalkin, for example, is an extremely intelligent man, who makes scientific prognoses founded especially on higher mathematics, on certain mathematical knowledge.

This is not just any old mathematician. There are many mathematicians, but among those many there are some people with a special gift.

And of course almost every one of us, and I exclude nobody, has elements in our own scientific views which we articulate, which admit of some imprecision and may not have been worked through as profoundly. You can't encompass everything. So there are some things there that raised doubts, of course. But we were able nevertheless to assuage those doubts, because we see what is positive in LaRouche's views, which can be further developed, and can even be assisted in its development. A dialectical contradiction of this sort is important.

I am grateful to have become acquainted with this phenomenon, and this movement. What I have seen of the Schiller Institute here [at this conference] is a serious scientific opposition, or social and scientific opposition—let me put it that way. If it were a purely scientific opposition, it would not of course attract such a large number of people.

Our Academy limits the total number of people to 100. As for the number of corresponding members who can be brought in, it is provided that each full member can nominate two candidates, members, who could subsequently become full academicians. Full membership in our Academy is not some honorary position or title, but it entails responsibility. A full member must raise material support, he must be able to conduct political negotiations, he must organize whole lines of scientific work, and he really must carry a big burden. So if you don't want to take on such a big load, you don't have to become a full academician. This is provided for.

**EIR:** How many full academicians do you have?

**Manusadjan:** There are only 24 elected full members at present. We have prepared to hold talks with scientists from various countries, like Australia, where Corresponding Member Kravchenko has just gone on a visit. We've had talks with Czechs and Slovaks, and Polish scientists, some of whom we met here, thanks to the Schiller Institute.

For me, it is important that we have people who are psychologically compatible, because our Academy is small. If we start accepting people indiscriminately, it will be distorted and become something other than it was intended to be. But I think we will be able to sustain the best aspects of our Academy.

Another important thing, is that we don't pay anybody. The principle of altruism is very important in creative work, when a person says: "I want to work, and it doesn't matter if I get a material reward." This is a very important principle. But our Academy has become so well known, that many prominent professors and doctors would like to join it, in order to acquire an extra hat.

We accepted several new members at the session where we inducted LaRouche. One is a professor, a doctor of medical sciences who specializes in vision. The problem he will

be working on as a corresponding member is how human vision will change and evolve. What will happen in 1,000 years, even if everything goes well. With the load of television and computer-watching that we have, vision cannot remain in its old framework. It will develop automatically, because man is not just looking at nature, which changes slowly and has its own rhythms, but there is a very dynamic information system. Its disruption could be such as to present some biological limits to the development of man.

The problem of education is a major one. Education cannot be the way it is in the world today, when knowledge is often not adapted to the individual person. We need to develop two things at once: to effect unification, so that there be universal education worldwide, but on the other hand make it individual. It is very difficult to reconcile these two opposites.

We elect everybody for life. We don't expel anybody from the Academy, but we have a status which people can shift to, and become expert consultants who carry a certain creative load. It's important to have a certain rotation, so that nobody stay too long in one place or decide that he is a dictator. It's very important for scientific creativity not to be dictatorial, but democratic.

**Muranivsky:** Prof. Boris Tareyev, doctor of technical sciences, was also inducted at the last session. He has a worldwide reputation, and he is a department head at the former Soviet, now Russian Institute of Scientific and Technological Information. We have assigned him electrotechnology, right?

**Manusadjan:** Electrotechnology and the power industry.

**Muranivsky:** He is the author of more than 80 scientific papers in his field. These works are also oriented to working through problems in the power industry to which Lyndon LaRouche devotes much attention. He knows and understands very well the theory of energy density, and how productive forces develop through the increase in energy density, which makes possible the economy of labor.

I would like to add something more, on the question of population growth. New works have recently appeared—and whether or not we call them “malthusian” or not, it is generally accepted in the sciences to link these ideas to Malthus' theory. That is the theory that there arise certain limits to population growth, and that efforts should be undertaken already now, to reduce the population. Some ecologists express the view, that if there were only 500 million people on Earth, then we would all live well.

But LaRouche, as we know, has a different concept. In his book *The Science of Christian Economy*, which I mentioned before, he stresses that in practice—and he grounds this in theory, showing how this is connected with the increase of population density and the development of infrastructure, projects like the “Productive Triangle,” around which industry, agriculture, and so forth are constructed in an entirely new way, and people can provide housing for themselves—a significantly larger population will be able to live in the same area and will be able to provide itself with

everything it needs to live, thanks to the development of the means of production and to scientific and technological progress as a whole. LaRouche stresses that in the foreseeable future, we cannot and do not have the right to say, if we are to be scientific about it, that some limits to the growth of mankind have been reached.

There's something else I'd like to say on this. Some calculations have been done, prognostications presented as if they had the force of laws of nature, to the effect that the world has been developing in such a way in recent years, that more and more of the population is living in Third World countries. They cite such statistics as that in 1950, something like three-quarters of the world's population lived in the Third World. Now it's already four-fifths. But by the year 2000 it will be, I don't remember precisely, but significantly more. By the year 2050, they say that nine-tenths of the world's population will live in the Third World.

What does it mean to live in a Third World country? It means that the productive forces are significantly less developed, wages are lower, the overall standard of living is lower. Education, expenditures on science, and so forth are not just a little bit less, but several orders of magnitude less than what we have today in the developed countries, despite the fact that the developed countries are currently experiencing a severe depression.

Therefore, when we talk about ecology today, we link these questions with various problems that confront mankind and must be approached on the basis of science, the development of basic science, and the progress of science and technology.

**Manusadjan:** There exists no such phenomenon as malthusianism. Malthus was a concrete person who had certain views. What does exist is something different: the interaction of species. These species can develop and grow to a certain limit. Therefore, malthusianism in what we call human society is better called demographic processes, demographic growth.

**EIR:** Do you know the theory and the work of the German scientist Krafft Ehrlicke on the extra-terrestrial imperative? He talked about the necessity for mankind to go into space, to colonize the solar system, because in the course of further progress we will have to not simply somehow find more room to live, but because only through this scientific work will we change the limits on Earth.

**Muranivsky:** Tsiolkovsky had ideas like that.

**Manusadjan:** Not only he. That's very important, that it was not only he. I may have the greatest respect for LaRouche, but he is not the only one to put forward the ideas of Physical Economy.

**EIR:** I was talking about Krafft Ehrlicke just then, not LaRouche.

**Muranivsky:** We are speaking more generally now. You

mentioned one author. I mentioned Tsiolkovsky, who worked earlier. . . .

**Manusadjan:** Or we could mention English scientists—Bertrand Russell, Haldane, or the American Dyson, who studied space problems.

**EIR:** No, not that school, or just anybody who was interested in space. I was referring specifically to Ehrlicke's idea of this *imperative*, that we *have to* go there, and that this will change the apparent consequences of further population growth on Earth.

**Manusadjan:** I could say this: When our Academician—you've probably never heard of him—Oparin was still alive. . . .

**EIR:** Yes, we know Oparin.

**Manusadjan:** Aleksandr Ivanovich Oparin; you do know him?

**EIR:** The biologist.

**Manusadjan:** Yes, he was a biologist, an academician, and so forth. I personally have documents of his in my archive at home, concerning his theory related to the line of work that emerged at a certain period, as you may recall, on the question of life in the universe—is there life in the universe, is there life on other planets? This was in the '60s and '70s.

**Muranivsky:** Even in the '50s.

**Manusadjan:** They talked about it then, but they didn't have the means to search, the radiotelescopes, and so on. A lot of things were under wraps. Then they opened up this work and set up an international project.

You know, on the question of civilizations in space, I brought a lecture text here for this conference, called "Eco-civilization." There's a special subsection on space civilization.

On the essence of the development of civilization as a phenomenon of the cultural development of society, we disagree with the classical policy, what you call malthusianism and so on. There exists an actual profile of the demographic growth of the human population as a biological species, having to do with energy—which LaRouche, among others, talks about—and with the existence of a certain supply of biological foodstuffs, which are not infinite. There are tens of thousands, not one or two, but tens of thousands of works already written on the ecology of food. The countries now suffering from hunger essentially have a food crisis, in that we have the science and technology, but we don't have its industrial realization.

To approach things constructively, it is very good that we have a dialogue and sometimes even an argument. Politicians conceive of the solutions to such problems in categories of force. Someone issues a decree, and all must work according to this decree! Someone else collected money, and he got rich! But in our Academy, I think that the scientists, including

Mr. LaRouche, share something that unites them. And that is that we put forward a perspective, a humanitarian technological perspective for the development of mankind, where the self-preservation of the population occurs automatically on the basis of principles.

The basic principle, which we have already touched on, is education. Historical experience shows that when a nation becomes educated, it becomes self-regulating. It no longer has an endless quantity of children being born. It finds means of contraception. Or a woman often prefers not to have children. The population begins to contract, having reached a certain critical volume, because people do not want to live in poverty.

Here we have important disagreements with the politicians. We have a constructive approach, as LaRouche also does. But some politician will seize one or two phrases from what you will publish, and say, "Look at these ecologists who say there should be self-limitation of the population, so the number of people should be reduced!"

So it sometimes happens that the ideas of scientists, when they fall into the hands of uneducated politicians, turn into cruel measures, used in genocide, used to degrade people, with poverty, poor medical care, etc. And I am in full solidarity with you here, that in the Ecology of Society it is very important to measure up to a standard. The standard is very important.

We had people in our Academy, with whom I personally conducted talks, Americans, for example, who reacted very harshly to LaRouche.

Of course in many of his works, LaRouche has flashes of genius that are sometimes hard to anticipate. He sees a kind of grand scale of things as a whole.

**Muranivsky:** It has to do precisely with the universality of his thinking. He looks at economic science in a completely different way from how traditional economists view it. The economists, since you mentioned it, have a *political* view of the matter.

Look at what's happening in Russia right now. They say we're going to do such and such with *money*, and the next thing you know there's inflation. . . .

**Manusadjan:** Absolutely right.

**Muranivsky:** So they say let's issue money *slowly* to deal with the inflation, and what happens to wages? People haven't been paid since September, or even June! This all results from monetarist theory, which pays no attention to the development of production capacities, to output, to a healthy system of trade—the kind of thing Mendeleyev was advocating, when he opposed "free trade."

How does LaRouche look at it? He comes to economics through mathematics, through the development of physics, through the exact sciences. It is no accident, that he calls economics "Physical Economy." This is one of the indications. It's not only because in economics itself we deal above all with physical goods, physical production capacity, and so

forth. He sees that the laws of the natural sciences apply to the development of the economy.

**EIR:** I would like to pose one more question, if I may. This is what I mentioned earlier, on the condition of science in general in Russia.

**Manusadjan:** This question must be understood; it is a very important question. If we look at politics and science in the world as a whole today, the politicians dominate the scientists.

**EIR:** I also mean the material side of things. It is hard to live and hard to do any kind of scientific work under the conditions you have in Russia today, and Americans do not know this. They do not understand that there is a threat that this whole scientific capability, the scientific capability of the former Soviet Union, will be destroyed.

**Manusadjan:** You used a brilliant expression [when we were discussing this before the interview], which I heard for the first time: That the *world* risks losing the enormous scientific capability which the U.S.S.R. and Russia had. I think this is very good. This is formulated in a startling way, and I heard it for the first time from you. This is really the case. Maybe everybody can understand it, but to formulate it in that way. . . .

**EIR:** When the president of the Schiller Institute, Mrs. LaRouche, spoke at the Russian State University for the Humanities this past spring, in her speech about the works of Nicolaus of Cusa she especially stressed his proposal that the achievements of each country or people should belong to all humanity.

**Manusadjan:** Yes, Helga LaRouche has said that science and scientists belong to all humanity.

**Muranivsky:** Chekhov said that there is no national science, just as there are no national multiplication tables.

**Mansadjan:** Yes, that's very good. Absolutely right.

Earlier, we scientists were in a layer of society that was relatively well provided for.

**Muranivsky:** It was a middle layer. . . .

**Manusadjan:** But adequately compensated, as to wages. Our [real] wages have now fallen to between 10 and 50 times—or even higher—less than what they were. When a person whose research may produce some palpable results in three years has somehow to live through the month, he of course is not going to be thinking about the three-year perspective of his work. He's thinking about how to buy a piece of bread tomorrow. Excuse me for speaking in such extreme terms. Costs have risen so very high.

I attended a conference in Moscow where there were about ten different Russian parties represented. When the question of monetarist theory was raised—well, monetarism is essentially a purely administrative theory. It functions by administrative measures, whether those involve money, de-

crees, or institutional changes, and it leads to a situation where, instead of finding the natural laws of social development, you begin to run society according to your own laws which correspond to no objective processes.

**Muranivsky:** Absolutely right. What does it mean to print money, anyway? That's also a decree.

**Manusadjan:** Yes, yes. And therefore I believe it would be very important for the people who read your journal to feel that they are involved in the life of the next generation through the technological process. Here we are in complete solidarity with your movement. There are many movements that support the technological process, but not all of them are set up very well.

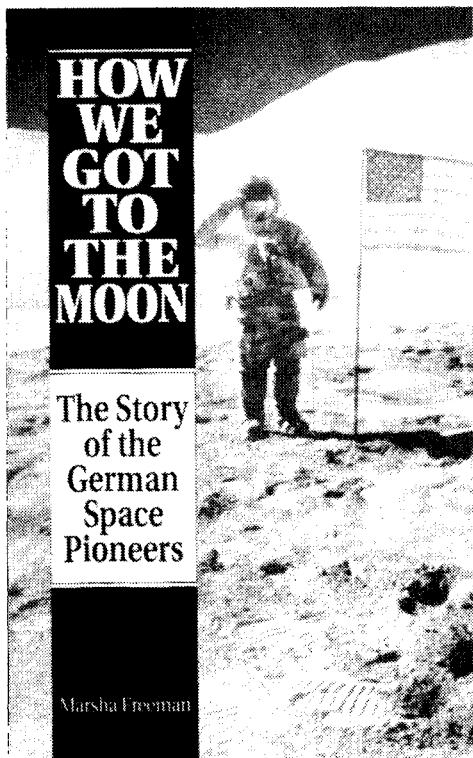
Many professional scientists and engineers, the intelligentsia—we always speak about the intelligentsia as a thin, thin stratum. By the way, it is my personal opinion as a scientist, that even Marx's formulation about the intelligentsia is inaccurate, where he speaks of the intelligentsia as a group or a stratum. Perhaps this was accurate in the last century. But in our century, it is already a powerful class.

Therefore, I personally think that the loss of Russian, formerly Soviet, scientific and technological capacity lies in that they possessed the knowledge necessary to master the Eurasian region. When people talk about major divisions of the world today, they mention Europe, Asia, Africa, and so forth. But from the standpoint of geographic reality, you have Europe with certain climatic conditions and potential, the physical conditions, like rainfall that helps crops and animal husbandry. And then there are the truly harsh regions of Siberia, never inhabited by mankind. And it must be said that only Russian people, the Russian people, could live under those difficult conditions.

**Muranivsky:** They not only could survive there, but they *developed* those regions.

**Manusadjan:** Quite right. The technology as a whole, the social infrastructure—because when I say technology, I don't just mean machines and equipment, but infrastructure which subsumes technological components, human components, cultural and historical legacies—creates a certain way of life for a certain civilization. This is what we call it, which is why we would like to conduct a serious conference on "Contemporary Problems of Civilization," with contributions from the Schiller Institute, because you formulate these things very well. Here I see the kind of friendly interaction that produces a good effect, because it is not constructive just to have confrontation all the time.

It seems to me that in time, the loss of the potential of that region—the loss of the forests, the air pollution—could lead to the kind of catastrophe, which the politicians who are trying to run our economy now are heading for. They are working for the moment: Get the resources. But how actually to *develop* that entire region is a question for scientists. And the loss of the Russian capability would be a blow to civilization as a whole.



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