

We Haven't Got Another Academy
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According to outstanding researchers, the Russian Academy of Sciences remains an efficient organization producing scientific knowledge in modern conditions.

The scientific-technical modernization came to be a current slogan in Russia. It is clear to every person thinking about converting this slogan into life that, without retaining and developing fundamental science, scientific-technical modernization is not feasible. The Academy of Sciences has been traditionally responsible for the condition and evolution of fundamental science in our Motherland since the time of reforms undertaken by Peter I yet. Of late, however, criticism, sometimes meaningful - as, for example, in the article 'Six Myths of the Academy of Sciences' by S.Guriev, D.Livanov and K.Severinov [3] [1] (Expert No.48, 2009), sometimes not very much - as in the speech delivered by Boris Gryzlov, State Duma Speaker (see 'On Obscurantism and Related Problems' [2] published in Expert No.4, 2010) is often addressed to the Academy.

Let us remind the readers that the authors of the article 'Six Myths ...' have formulated the following claims to the Academy of Sciences:

1. Before the revolution the Academy was no more than a scientific club; after the revolution it turned into a ministry of science, which bureaucratized the governing of science to the maximum.
2. In market conditions governing of science should be decentralized.
3. The Academy uses financial means inefficiently.
4. The Academy does not want the scientific diaspora return back to the country because it is afraid of competition.
5. The Academy does not apply most efficient indicators, like publication activity and citations, to assess researchers' performance.
6. In Russia the efficiency of researchers engaged in institutions of higher learning is higher than that of academic researchers.
7. That is why in the majority of countries fundamental science is pursued in universities.

In conclusion the authors made the following suggestions about the Academy find a way out of the crisis (as they qualify the situation):

1. Introduce international audit of institutes and laboratories to test their scientific competence.
2. The efficiency of researchers' performance should be assessed by their publication activity and citations.
3. Enhance the competitive component in funding science by augmenting the quantity of grants extended by the Russian Foundation for Basic Research (RFBR) and the Russian Foundation for Humanities (RFH).
4. Introduce a professional system of Academy's property management and, on this account, raise the level of researchers' pensions.
5. Accelerate rotation of scientific and administrative personnel and its mobility.

In the editorial preface to the article 'Six Myths ...' we stressed its debatable character and invited the academics to join in the discussion. We received responses from Nikolai Dobretsov, outstanding geologist, RAS Academician, member of RAS Presidium, chairman of the RAS Siberian Branch (1997-2008), and from recognized economist Natalya Ivanova, RAS Corresponding Member, Deputy Director of RAS Institute of World Economy and International Relations.

Besides, we have discussed the problems of the Academy with Academician Ludvig Faddeev, member of RAS Presidium, expert in mathematical physics best-known in the world.

- Many critics hold the existence of the Academy of Science as an institution hampers the evolution of science in Russia and argue, in general, the entire fundamental science should be concentrated in

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universities, following the example of the U.S.

- I think it's just an opposite case. The Academy of Sciences came to be an exceptionally successful institution for the Soviet Union and modern Russia because it helped carry out highest-level researches in very many areas of science financed by a factor lower than in the U.S. – even in the time of the Soviet Union, not to speak of our time.

One of the paradoxes of soviet power consists in the fact that in its time we conserved the organization of fundamental science in the form it was shaped in the early 20th century, during the great scientific boom. In the form later ruined in all Europe by World War I. We conserved it, and it shouldn't be destroyed.

As to shifting fundamental science to universities, it is simply unrealistic, apart from dissipating resources, because professor's loads in our universities make 16 hours and in American universities 4 hours. Then, how should you increase the number of professors to do it?

- It was typical for the Soviet Union to develop all lines of science. Russia is now significantly smaller than the Soviet Union. By all appearances, Russia hasn't got these opportunities.

- Why do you think so? First, fundamental science in the USSR was mainly concentrated in the RSFSR. And, what is principal, if we are now a great power we should have a great science, this seems obvious to me. Among other things, this is important also from the point of view of security. Imagine new generation arms has surged. Nobody will sell them to you. Even if you steal the secret it would be useless if you have no experts versed in the relative area of science. Take the textbook case of the atomic bomb. Thanks to the intelligence service we got hold of American data, but we could make use of it only because we had highest-level experts in nuclear physics. As you may remember, in the 30s many people thought nuclear physics is futile and absolutely impractical. But we managed to stand up for it and, as a result, both in the Leningrad-based Physical-Technical Institute and the Radium Institute there were experts in nuclear physics, in radiochemistry. And our country proved not to be unarmed.

The main problems of our science lie not so much in science itself but in the attitude of society to it: loss of science prestige and of intellectual knowledge as a whole, crisis in education, problems with the young generation, which abandons science and does not show interest in it. And, of course, a gap in the middle generation of academics, who should have passed our scientific traditions to the young ones. If I am 75, how can I teach a man of 20? We must have a common language with him. I have to comprehend his psychology, his world outlook, know his interests, not only scientific, his musical and literary taste.

- How could you evaluate the present condition of national fundamental science?

- I can only be responsible for the areas I know - mathematics and theoretical physics. In spite of maximal losses we have suffered due to emigration of scholars we, nevertheless, have retained the world level.

In St.-Petersburg the Leonard Euler International Mathematical Institute was founded. In 2008 we organized an Euler festival honoring the 300th anniversary of the great mathematician. All its participants stressed we maintain a wonderful academic level.

I can add that although in the 90s 40 out of 70 doctors of sciences working in the St.-Petersburg branch of the Steklov Mathematical Institute left the country, now they have about 50 doctors and candidates of sciences on the eve of gaining the doctor degree. As you see, by now we have succeeded in replenishing cadre losses.

But the problems of young researchers, transfer of traditions and knowledge are now pivotal in our science. The difficulties are not only a small number of job vacancies. A scientific worker should be confident he will be able to live a dignified life in his country. No secret, many people go abroad because there they can afford to buy a flat, a car and not worry about everyday life. Here a young man without his parents' support cannot afford it.

- Many people reproach the Academy for the fact the funding of science increased manifold in recent years but the output does not meet it.

- Manifold compared with what?

- With the 90s.

- You know, if zero is multiplied by infinity you will, nevertheless, get not very much. In the 90s we had, practically, zero. If there were some well-off people, they were liberal economists who, probably, up to now do not know that a professor earned four thousand rubles. If now he earns 30,000 (by the way, not all of them), which is already a decent sum, it is, all the same, a clerk's level in a rich private company. Therefore, to say funding has increased manifold is immoral. We have come to a more or less dignified standard of living for a person who already has a flat he received in the past. Meanwhile, researchers went on working in the 90s as well, with a wage of even four thousand rubles.

- The problem in permanent debate is how to measure the efficiency of expenditures for fundamental science. Many people regard citations and the quantity of publications as the main criterion.

- I do not agree categorically. To avoid somebody's suspects I am an interested person I'll just say my citation index is good. But I affirm the citation index is only one of many indicators by which scientific work can be assessed.

The International Mathematical Union dedicated a special report entitled 'Citation Statistics' to the issues connected with statistical assessment of scholars' work. I shall quote its main conclusions: 'We do not dismiss citation statistics as a tool for assessing the quality of research... We recognize the assessment must be practical, and for this reason easily-derived citation statistics almost surely will be part of the process. But citation data provide only a limited and incomplete view of the research quality, and the statistics derived from citation data are sometimes poorly understood. Research is too important to measure its value with only a single coarse tool.'

We should also understand that the citation index, particularly the impact factor, i.e. relative citation frequency per 'average' article in the given journal over a certain period of time, depends heavily on the research discipline. The same report of the International Mathematical Union attaches a wonderful graph to illustrate it (see graph on Average Citations per Article, www.mathunion.org/fileadmin/IMU/Report/CitationStat).

As you know, one of Russian mathematical school's most significant accomplishments is the demonstration of Poincare hypothesis by Grigori Perelman who has been working in our institute. Unfortunately, he has now abandoned science. During seven years he had not published a single publication - engaged in demonstrating his theorem. Just imagine, the Institute director would have applied to him the criteria you mention. He would have been, certainly, fired.

The example also confirms the opinion I always stand for: researchers' work can only be assessed by researchers themselves. Of course, officials would find it convenient to use a simple numerical indicator to evaluate our performance. Otherwise, they are compelled to read our yearly scientific reports. But how can non-professionals understand them? It's another story that if researchers are trusted they should show a high ethical level and moral authority.

Science should be governed by researchers, professionals, not managers. Managers will pay enormous money to themselves and treat the researchers like the toad under the harrow. It seems to me today people start to realize: a simple manager in charge of financial flows, without professional expertise, does not suit. The example of Sayano-Shushenskaya hydropower plant is quite plausible.

Many critics of the Academy argue academic work should be assessed by publications in foreign journals. Once you pledge, don't hedge, it means our national journals should be closed. To me, the path should be

different: we should make our journals more prestigious. I can say, for instance, our mathematical journals are translated and very well known abroad.

Let doctor Severinov, one of the authors of the article 'Six Myths of the Academy of Sciences' published in your Expert journal [3] [1], which severely criticized us, start a good national journal on microbiology since he has returned home from the U.S. and thinks his laboratory here is the only good one in the Academy (as he himself recently declared in an Expert-TV program).

Since we have mentioned the article, I couldn't see its authors are concerned about national science. In addition, it is full of absurdities: addressing Perelman as 'returner' counts for a lot, the same refers to Academician Landau. Both Landau and Perelman were working in national institutes, never left the country and went abroad on academic trips.

- Some of our researchers working here say: they feel forced to publish abroad due to our circumstances: our journals are read abroad but not cited.

- This happens, unfortunately. When some foreign researchers decided the citation index is valuable to be famous and, mainly, to get grants, they started to artificially raise their indexes. We know examples of entire laboratories striking deals to cite each other: we cite you, and you cite us. Certainly, they do not need strangers. It's competition.

- You have said the Academy must have high moral authority. And how do you evaluate today's moral level of the Academy? Notably, in connection with the Petrik story, which has caused wide public response?

- The Petrik story is sad, I think it did much harm to the Academy. There is much in it I do not grasp. Although in this case as well as in many other cases, our commission on pseudo-science and particularly its president, Academician Eduard Kruglyakov, have done a lot to unmask quacks. The same, for example, refers to torsional fields, or energy generation from granite. But if we come to discuss the Petrik case, why has Gryzlov signed a patent with him to purify radioactive water?

Unhappily, moral and ethical problems exist in the Academy as in any big collective. In expectance these questions would be raised, I have prepared for our interview a very typical quotation taken from the memories of the renowned mechanics Barenblatt about Academician Kolmogorov: 'Academies surged in various countries in the epoch of industrial revolutions. The governors needed experts ... but experts who could place their reputation above all ... So, as it frequently happened, Andrei Nikolaevich [Kolmogorov] made his own 'calculations' as to the numerical correspondence to be complied with to ensure the Academy's health, i.e. permanent availability of a sufficient number of high-professional, conscientious and responsible experts. Researchers who cannot but not be elected to the Academy should account for 30 percent of all academicians. They may be unpleasant in personal intercourse, even repulsive, but their research results should evidence a level which means: if they are not elected to the Academy it might be dangerous for the Academy's prestige. Another 40 percent should be given to those who, if elected, will be good academicians; if not elected, no catastrophe for the Academy. And only in this case the remaining 30 percent will be filled by those who may, but shouldn't be elected (as far as I understand, because of their insufficient scientific level). If this proportion is violated the Academy may lose its authority and public, hence, state support.'

I am convinced more than the majority of Academy members meet their status and ensure the Academy's high moral authority. I don't think at least another big organization in our country may be found in which 50 percent of its workers meet their status. Of course, there are workers in academic institutes I wouldn't take for exceptional researchers. But I think all those who deal with big organizations know that in any such system there is always a background. Even a genius will lose much if he has nobody altogether to talk with. We all need people to communicate with professionally, what is called environment.

To me, Academician Kolmogorov was right in outlining the proportions of this environment for

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the Academy.

- At present, much hope is placed on getting the research diaspora back. Need we and can we have these researchers back, and what is to be done to achieve it?

- I think it is practically impossible to have them back. I can state it on the basis of my experience, I have already mentioned 40 doctors of sciences who have left the St.-Petersburg branch of the Steklov Institute. They gladly come here and lecture, take part in seminars. But they would refuse to return forever having a flat, a car, a guaranteed pension abroad. Their children grow in a different culture already. Since in Europe they have a pension age limit - when you reach it you cannot continue working any more - then, eventually, elderly researchers would return to our country, not those aged 40. I myself have received several signals of the kind: yes, in about two years I'll most probably come back. We shall, of course, engage those who work well. But I do not expect a massive return.

As you know, recently a letter signed by a big group of scientific diaspora representatives was published. I agree to a considerable degree with the way they formulate problems of Russian science. But then, why aren't we, who live and work here, heard when we speak out and write the same about science, whereas they were heard at once, even at the highest level? As to the opinion they would return if paid like abroad, I think it would be immoral. The question surges: How to deal with those who hadn't abandoned our country, went on working here and contributed to saving our science?

I am sure not a single person among serious researchers who left the country would give his consent to privileged conditions if he decides to come back home. And if he does, for me, he is an immoral person.

- And are researches of need in power?

- I think in the presidential administration a strong and independent researcher in natural sciences should be present. I can remind you that a world-class scientist, expert in condensed matter physics, Nobel prize Chu sits in the administration of US President Obama.

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