Happy birthday to RU

Twenty years after the implosion of the Soviet Union, a significant hole in the world map of science remains. Russia, one of the great civilizations of Europe, produces far less scientific output than comparable nations: in biosciences, The Netherlands publishes three times as many papers annually, despite having little more than a tenth of the population and less than half the GDP of Russia.

The widespread perception of post-Soviet Russia is that it is an ultra-capitalistic consumer society, dominated by a rich elite, with the majority of its population stuck in relative poverty. The esteem placed upon academic science in such a social system is unsurprisingly low. But is this picture accurate? Physics and mathematics attained a high level in the Soviet Union, even if biology was always handicapped by the ideological legacy of Lysenko.

During the early 1990s there was a major exodus of scientists. Many of them today enjoy highly successful careers in the USA, Western Europe and elsewhere. But their motivation for leaving was not greed or bloated ambition. It was a necessity, since financial support for science suddenly and completely dried up and remained at a very low level for many years.

There is some evidence that Russia has at least turned the corner, and that its government has begun to take seriously the aspirations of its scientists and the possible benefits that their work might bring to society. Nevertheless, major structural problems remain, not least of which is the stultifying bureaucracy that long pre-dates communism, and that still endures two decades after Dzerzhinsky's statue was overturned. For example, despite recent 'clarifications' in the law, Russian scientists might still be obliged to obtain competing quotes from different companies to buy even the most trivial of reagents. Academic salaries in the main remain far below international levels and, more importantly, far below those enjoyed by other highly

trained professionals or business managers in Russia. Especially in Moscow, with its sky-high cost of living, scientists simply cannot survive without undertaking some other paid employment, which obviously limits their scientific productivity and dents the motivation of students.

The recently inaugurated mega-grants scheme was designed to attract back some of the most successful Russian expatriate scientists, at least enabling them to take up adjunct positions in Russia while continuing to run labs in the West. Despite its shortcomings, the most glaring of which is its short-term nature, this programme has succeeded in enticing back some of the leading talents of the lost generation, who naturally bring with them a clear understanding of how science needs to be organized for success. In fact, many within Russian academia hope and believe that this elite group, with access to the senior government leadership, can act as a vanguard to improve the climate for science more generally. The threat that, if things don't work out, they will just pack their bags once again, acts as an incentive for the government to get it right, even in Russia's imperfect democracy. Some others, conversely, are jealous of the special treatment afforded to returning exiles. Unless those who stayed through the lean years are given a clearer stake in the success of the returnees, they might act as a fatal drag on its chances of bringing about any lasting improvement.

Surprisingly, despite the fact that travel and contact with the West is no longer restricted, a major problem for Russian science today is its continuing isolation. To break out of this self-imposed ghetto, Russia must adopt transparent review procedures, reward publication in international journals, implement English language, and foster links with centres of excellence abroad, not just those headed by Russian emigrés. Basic science, in particular, needs to be nurtured. The EU is gradually abandoning programme-led research, in favour of

investigator-driven competition. Russia should follow this example and create fully independent agencies to manage the state's investment in science, with a remit to foster high-quality research. The negative impact of the missing generation upon the standard of university education needs to be recognized and concrete actions taken to reward or even import teaching competence. Ethical standards comparable with those in the West need to be rigorously implemented, or else Russian scientists will continue to find it hard to publish their findings. Some tentative steps in these directions are being taken, but courage is needed to reinforce them, given that their effects will be seen only slowly.

Russia cannot do all this alone. A more active policy is still needed on the part of international organizations, especially at the European level. Funding for returnees can help them avoid the continuing snares of the bureaucratic system, and keep the mega-grants scheme and its offshoots aligned with international norms. To facilitate this, Russia itself must participate fully in transnational bodies and provide appropriate support to their programmes. Since its needs, but also its potential, far outweigh what it can reasonably be expected to contribute, Russia can only gain from such involvement.

Although Mother Russia exerts an unquenchable emotional power over her absent children, many are also reluctant to return to a society where criminality, corruption and the arbitrary exercise of political power are still seen as endemic. Freedom has been accompanied by the decline of social provision in health, education and housing, on which low-paid state employees, including scientists, depend. Russia's leadership needs to clean up its act not only to satisfy squeamish Western liberals, but because of all the benefits and opportunities it will surely create for its own citizens.

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