Can Russia Slim Down to Survive?

A new report calls for a 50% cut in the scientific labor force, but will it happen in time to save an impoverished enterprise?

MOSCOW & ST. PETERSBURG—It's a typical October morning at St. Petersburg's Institute of Evolutionary Physiology and Biochemistry. A handful of researchers sit huddled over their coffee cups, wearing overcoats to keep out the cold—in a desperate attempt to conserve money, the thermostat has been lowered. "We try to make ends meet," says chief finance officer Nadezhda Kukoleva. But with virtually no money for reagents, few researchers can do any real work. And old-timers like neuroendocrinologist Andrei Polenov say they have to think back to the dismal days after the Second World War, when biologists made microscope slides out of window panes, to recall bleaker times.

AP/WIDE WORLD PHOTOS

Repairs needed. The recent parliamentary crisis has opened the door for major reforms.

This scene is all too familiar throughout Russia, as even top labs struggle to stay warm amid the economic freeze. "There is no real money for experiments, for reagents, for materials," Russian science minister Boris Saltykov noted in an interview with *Science*. Grants and contracts designed to shore up the crumbling scientific infrastructure have begun to trickle in from foreign sources, but they are only temporary band-aids for a system with mortal wounds. The entire Russian research enterprise itself, many researchers here believe, is in urgent need of restructuring.

That message was driven home earlier this fall by a panel of outside experts put together by the Paris-based Organization for Economic Cooperation and Development (OECD). In a report requested by the Russian government, the panel said Russia must slash its scientific work force in half to avoid catastrophic disintegration of its research system and the loss of dozens of world-class laboratories. With its economy in ruins, the OECD concludes, Russia can no longer afford to live like a scientific superpower.

Privately, many Russian researchers and policy makers agree that bitter medicine is needed. "It would be much better to reduce the size of institutes and create better conditions for working scientists," says population geneticist Yuri Altukhov, director of Moscow's Vavilov Institute of General Genetics. And Western observers point to a brief window of opportunity for reform: With President Boris Yeltsin ruling by unopposed decree until a new parliament is elected next month, Saltykov—in theory, at least—needs only to convince Yeltsin of the value of implementing the OECD's recommendations.

But the OECD's prescription seems to be too much for Saltykov to swallow. Indeed, even modest reforms have created deep divisions within Russia's scientific establishment. Saltykov's ministry is engaged in a power struggle with the Russian Academy of Sciences, which runs more than 300 institutes that are the backbone of Russia's effort in basic research. Virtually every move Saltykov has made to reorganize Russian sci-

New Foundation Goes Back to Basics

Few research agencies have had a more difficult birth than the Russian Foundation for Basic Research (FBR). Created in April 1992 as Russia's answer to the U.S. National Science Foundation, the FBR was accused of favoritism and became embroiled in a bitter tussle over its leadership. Yet it has survived these problems to become one of the best means to put limited science funds into the hands of the most able researchers.

Launching Russia's first-ever multidisciplinary, Western-style grant agency would have been a formidable task under the best of circumstances. But the bitter rivalry between reformist science minister Boris Saltykov and the conservative Russian Academy of Sciences has made matters much more difficult (see main story). The seeds of open conflict were sown when Saltykov agreed to let physicist Andrei Gonchar, an academy vice president, serve as its temporary founding chairman.

Although Saltykov intended this as a conciliatory gesture, it only delayed the outbreak of hostilities. Many scientists complained that its first round of some 9000 grants, distributed at the beginning of 1993, favored members of the academy's governing presidium. "It was not a real peer-review system," says Maxim Frank-Kamenetskii of Moscow's Institute of Molecular Genetics. But when Saltykov tried to replace Gonchar, the academy went on the offensive. On paper, Saltykov had a watertight case: FBR's statutes prohibit its chairman from holding a senior position in another agency. But the academy fought him all the way. "Both went to President Yeltsin, and pulled all the personal strings they had," says linguist Nikolai Vakhtin, co-chair of the St. Petersburg Association of Scientists, a pro-reform lobby group.

In June, however, Gonchar was forced to step down. His successor, physicist Vladimir Fortov, is now reforming the grant selection process that attracted such criticism. "We are establishing very strict procedures now to avoid conflict of interest," he says. One will prevent the 29-member board that approves the final list of projects from having any say in the initial ranking of proposals based on referees' reports.

Even if FBR operates smoothly, however, the foundation can do little if its share of state civil research spending isn't increased beyond the current miserly 3%. But that can come only at the expense of other agencies, who won't give ground without a fight.

–P.A.

ence—such as the formation last year of the country's first Western-style granting agency (see box, p. 1200)—has led to conflicts with the academy. And these rows would surely escalate if Saltykov tried to force the academy and other agencies to cut their staffs.

In addition, three-fourths of Russia's R&D is connected to the country's still enormous military-industrial complex, which is largely independent of both Saltykov and the academy. No plan to shift resources into more productive civilian activities can succeed without the approval of the powerful defense ministry, and "the military is not really interested in the Ministry of Science," says Harley Balzer, director of Georgetown University's Russian area studies program and one of the authors of the OECD report.

Given these difficulties, the OECD report's authors say they understand why Saltykov has so far balked at the idea of closing ineffectual research groups. But they say his alternative—an effort to pry extra funding from the finance ministry to reward researchers who are capable of top-flight work—is gambling with the long-term future of Russian science. Indeed, given that Russia's material wealth is now about one-third that of the United States, the OECD asserts that Russia should employ about one-third the number of researchers retained by its former rival. That means a scientific work force of 300,000—less than half the current figure.

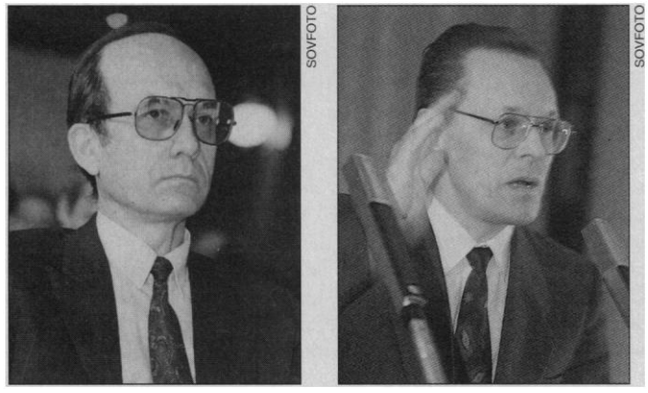
A sagging foundation

Despite opposition to such drastic cuts, the bricks are already starting to fall out of the country's research base. Since 1990, the government's science budget has shrunk by some two-thirds in real terms. And because the scientific work force has been reduced by only 30% over the same period, salary costs now consume most of the available funds. The result? Labs throughout Russia are grinding to a halt.

This bleak picture has forced world-renowned institutes to adopt desperate money-making strategies. Two of the 11 ships in the research fleet of the Shirshov Institute of Oceanology in Moscow, for instance, are being leased out as Baltic Sea passenger ferries. Meanwhile, researchers with nothing to sell but their scientific expertise are looking abroad for a lifeline—to agencies such as financier George Soros' International Science Foundation (see box, this page).

The irony, however, is that the salaries bringing Russian science to its knees are already pitifully low. A scientist's basic wage "is not sufficient to maintain a family," says Vadim Ivanov, director of the Shemyakin and Ovchinikov Institute of Bioorganic Chemistry in Moscow. In Russia's embryonic, but sometimes brutal, market economy, researchers now earn less than manual laborers—a far cry from the days when scientists were among the best-paid workers in the Soviet Union.

Given these dismal conditions, some scientists are jumping at the chance to work abroad. The total number of émigrés is still relatively small—OECD officials put the figure at fewer than 30,000. But those who are leaving are the type—young and productive—that Russia can least afford to lose. As a consequence, some Academy of Sciences institutes are now "just ghosts," says Maxim Frank-Kamenetskii of the Institute of Molecular Genetics in Moscow, who is himself moving to Boston University. The result, says science minister Saltykov, is a policy paradox: "[W]e are still continuing to finance some institutions from which the best specialists have already left." Even so, Saltykov has distanced himself from the call to purge lame-duck scientists, and at a meeting in Moscow in September to discuss the OECD report, he chastised the organization for ignoring the social implications of sudden widespread unemployment for scientists.



Turf battle. Science minister Boris Saltykov *(left)* and academy president Jury Osipov are vying for control over basic science.

No executioner

But Saltykov's is not the only voice raised against the need for cuts. As interviews with more than 50 researchers and science administrators reveal, there's scant enthusiasm at any level of the Russian research system for the OECD's proposal.

Most scientists—including many of those who undoubtedly could survive a purge—seem to prefer their current privations to the al-

Soros Seeks Secondary Sources

The International Science Foundation (ISF), which has led the way in getting science aid into the former Soviet Union (*Science*, 10 September, p. 1380), has found that success breeds its own headaches. Its solicitation for requests for some 1000 large research grants—following the distribution of $500 emergency payments to several thousand deserving scientists—has attracted twice the anticipated number of proposals. As a result, the foundation will have to reject up to 90% of the 8000 or more applications, unless it decides to award smaller grants.

Although such a tiny success rate will further damage researchers' already flagging morale, even greater disappointment lies ahead if ISF can't raise some more cash, fast. Billionaire financier George Soros, who gave $100 million to bankroll ISF for 3 years, says he may close the foundation when the initial contribution runs out if other donors won't share the load. To woo those donors, he has turned to one of the big guns of science fundraising—Nobelist and former U.S. human genome project head James Watson.

Watson was recently appointed chairman of ISF's executive board, replacing Georgetown University Russian science policy expert Harley Balzer. Although he declined to comment on his fundraising plans when approached by *Science*, the most likely sources are grants from the U.S. State Department or joint efforts with a $25 million U.S.-Russian foundation that Representative George Brown (D–CA) hopes to create. Although either source could involve funding research groups with roots in the military, ISF's chief operating officer, Gerson Sher, says that need not weaken ISF's commitment to fundamental research. "[T]here are some areas of weapons research where people have been performing basic research...by any definition," he says.

In the meantime, ISF is preparing to spend $5.4 million on several hundred "Soros professorships," rewarding leading university science tutors in the former Soviet Union with teaching grants to supplement their miserable salaries, as well as $4 million to distribute Western journals to cash-starved libraries. The latter is long overdue, say some scientists. "If people have not seen the literature for one and a half years," asks Maxim Frank-Kamenetskii of the Institute of Molecular Genetics in Moscow, "how can they write a grant application?"

–P.A.

ternative of enforced selective redundancies. At St. Petersburg's Institute of Evolutionary Physiology and Biochemistry, for example, even the technician whose sole job in the Soviet era was to operate the Xerox machine—preventing its use to copy politically "subversive" material—has not been fired. "We don't have a well-developed system of help for the unemployed," says the Vavilov Institute's Altukhov.

The same sentiments extend to the top of agencies like the Academy of Sciences. "Nobody wants to be an executioner," says immunogeneticist Rem Petrov, the academy's vice president responsible for biology. And although a recent letter from the academy to Yeltsin has—according to press reports—backed the OECD's call to close ineffectual research groups, its leadership clearly believes that other agencies should bear the brunt of any cuts. Applied mathematician Jury Osipov, the academy's president, declined to discuss with *Science* the letter to Yeltsin. But he says he would oppose any attempt to impose mass redundancies on the academy, and he adds that any layoffs must be compensated with "very serious financial support" for retraining.

Given the obstacles, Saltykov's ministry is concentrating on programs to reward top-class groups, a break with the Soviet tradition of doling out funds to research groups more or less on a per capita basis. In its most recent letter to Yeltsin, for instance, the ministry calls for a program of new "state professorships" to give improved salaries and priority research funding to several thousand leading scientists. But without a plan to cut funds from ineffective groups, such schemes depend upon Saltykov's ability to find substantial new funding. The ministry complains bitterly in the letter that, over the past 9 months, only 53% of promised government research funding has materialized, and he demands that science spending be increased from 3% to 4% of the Russian state budget. And Georgetown's Balzer says the reinstatement of Saltykov's political ally, Yegor Gaidar, as first deputy prime minister, might allow him "to pry a little more out" of the government.

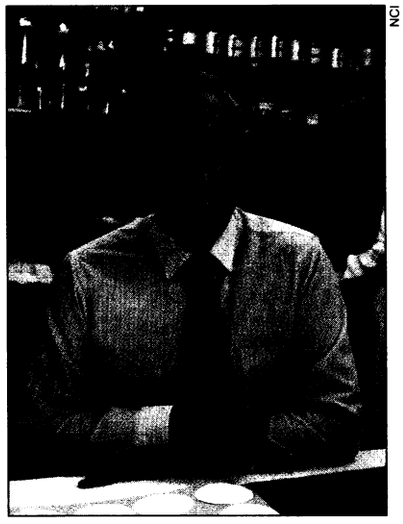
Although these political maneuverings could determine the fate of many Russian labs, most beleaguered researchers are too preoccupied with daily survival to reflect on their implications. "It's hard to take a broad view," says Andrei Mirzabekov, director of Moscow's Engelhardt Institute of Molecular Biology. And after last month's violence, many are simply relieved the streets are again calm. "What we need," said mathematician Victor Sadovnichy, rector of Moscow State University, as he glanced from his window toward the distant hulk of the burned-out Russian White House, "is political stability."

–Peter Aldhous

SCIENTIFIC MISCONDUCT

ORI Drops Gallo Case In Legal Dispute

A 4-year federal investigation into the conduct of AIDS researcher Robert Gallo disappeared last week in a puff of legal smoke as the Office of Research Integrity (ORI) abruptly dropped misconduct charges against Gallo. ORI says it couldn't meet what it sees as an overly restrictive definition of scientific misconduct—a definition it is trying to change—while Gallo's defenders say the government never had a case at all and is hiding behind legal excuses for a resounding defeat.



NCI

Off the hook. Gallo says he's "vindicated" by ORI's decision.

ORI abandoned its case just days before a court-like federal appeals board was scheduled to hear opening arguments in Gallo's appeal of three misconduct charges ORI had leveled against him. The move came 1 week after the appeals board overwhelmingly rejected ORI's charges against Mikulas Popovic, Gallo's former associate at the National Institutes of Health (NIH) (*Science*, 12 November, p. 981). In both cases, ORI blamed the board's insistence that it prove not only that statements made by the two researchers in key papers in *Science* were false, but that they were deliberately intended to deceive and had a material effect on the conclusions of the paper—two standards it had not originally expected and did not feel it could meet.

In a statement released last week, ORI explained that the Popovic ruling, along with two previous decisions (*Science*, 29 October, p. 643, and 13 August, p. 819), "established a new definition of scientific misconduct as well as a new and extremely difficult standard for proving misconduct." As a result, ORI said, the panel's decisions "have made it extraordinarily hard for ORI to defend its legal determination of scientific misconduct regarding Dr. Gallo."

But critics contend ORI simply didn't have a case. "They're attempting to save face by suggesting that the failure of their case is due to some 'new definition' of scientific fraud," said Martin Delaney, director of the AIDS group Project Inform, in a statement. "These people have clearly lost their case on the basis of the evidence, yet they are now pretending otherwise." Others point to the board's criticism in the Popovic ruling of ORI's legal competence and judgment. The board concluded ORI would have lost even under its own definition of misconduct. Last week, Popovic's lawyer wrote to Donna Shalala, secretary of the Department of Health and Human Services (HHS), asking her to stop ORI from claiming otherwise.

The charges against Gallo began 4 years ago as an allegation he had stolen from a group of French researchers the AIDS virus he is credited with co-discovering. But that charge evaporated when it became clear that contamination—rather than misappropriation—was the most likely explanation for the fact that Gallo's virus was virtually identical to that isolated by the French. As ORI tried to boil down the allegations to what it could actually prove, it settled on a set of relatively minor alleged wrongdoings: that Gallo misstated his laboratory's ability to grow the French virus, invested insufficient effort to determine the origins of a key cell line, and imposed severe restrictions on certain groups that wanted to use his research materials.

Gallo says he's "completely vindicated" by ORI's decision to drop the charges against him. "I feel happy that it's over and I think that people can now see through [ORI's] allegations." His attorney, Joseph Onek of the Washington firm Crowell and Moring, says he's disappointed the appeals board did not have a chance to address and dismiss the charges against his client, but he says that ORI's decision marked "an end of irresponsible charges of misconduct and a terrific beginning of a new era for Dr. Gallo." Gallo has not decided on his next step, but he hasn't ruled out further legal battles, including libel suits, to try to clear his name. "Is it worth my war? Maybe no. Is it worth a lawyers' war? I think the answer is yes."

Although ORI could conceivably launch a new investigation of Gallo if it were based on different charges, a more likely follow-up in the case appears to be a report from Representative John Dingell (D–MI), chairman of the House committee that oversees NIH and its parent body, HHS. Committee staff members have been investigating possible administrative misconduct in the actions of HHS and Patent & Trademark Office officials during the patenting of the AIDS virus,