International Cooperation to Prevent Biological Weapons Research and Development

Amy E. Smithson, PhD[a]

Based on interviews with dozens of former chemical and biological weaponeers in the former Soviet Union, as well as interviews with US, European, and Russian officials this discussion addresses a very important proliferation problem and the programs that are meant to resolve that problem, as brain-drain proliferation efforts.

When Americans think about proliferation problems in the former Soviet Union, they're most likely to think about "loose nukes." This discussion focuses on the more human context.

First, the report presents some preliminary data on the size of the scientific communities working on nuclear, chemical, and biological weapons in the former Soviet Union. The total number of weaponeers is roughly comparative in the nuclear and biological fields. Unfortunately, an exact number of chemical weaponeers could not be obtained. The US government deems 7000 bioweaponeers to be a critical proliferation risk should they sell their expertise or perhaps weapons materiels to other governments or terrorist organizations. Interestingly, there are fewer critical chemical weaponeers and fewer still nuclear weaponeers than critical biological weaponeers that would pose that type of a threat.

In the collapsed Soviet Union, there is a Toxic Archipelago, a string of facilities scattered across eight different countries. For those unfamiliar with the astounding achievements of the former Soviet biological warfare program, the following is a thumbnail sketch. More than 50 nominally civilian institutes were involved in the research, development, testing, and production of biological weapons. In addition, there are four military institutes involved that no outsider has ever set foot in. Only the Russians have been in there to date. The Soviets conducted research with more than 50 diseases for military purposes, weaponizing several of them, including tularemia and Marburg virus. They also produced tons of anthrax, plague, and smallpox and loaded these agents on top of ballistic missiles aimed at Western civilian population centers. Some of their agents were made antibiotic resistant, and, according to the former Deputy Director of Bio Preperat Ken Alibek, they were also conducting research into chimera agents

[a]Chemical and Biological Weapons Nonproliferation Project, Henry L. Stimson Center, Washington, DC 20034

Address correspondence to: Amy E. Smithson, Senior Associate, Chemical and Biological Weapons Nonproliferation Project, Henry L. Stimson Center, Ninth Floor, 11 Dupont Circle NW, Washington, DC 20034; tel. 202-223-5956; fax 202-238-9604; e-mail <asmithson@stimson.org>.

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Critical Weapons Scientists Across Disciplines

	Total Number of Weaponeers	Critical Weaponeers
Nuclear	50,000 to 60,000	2,000
Chemical	6,000+	3,500
Biological	65,000	7,000

Figure 1.

that would marry two diseases to create a superbug. No one knows how far they got in this regard. In addition, 10,000 scientists were working on anticrop and antilivestock agents. When the Soviet Union collapsed, the seven governments that inherited these facilities were largely unaware of what they had on their hands. These were top-secret facilities, and the governments were unprepared to incorporate them or the scientists employed there into the civilian economy.

When Yeltsin stepped up in 1992 with the mea culpa that the Soviet Union had violated the biological and toxin weapons convention, he also decreed that the offensive weapons program would be shut down. Unfortunately, his decrees have been implemented unevenly, largely because a number of the individuals who ran these offensive weapon programs are still in their jobs, in the ministries that oversee these institutes, and in the institutes themselves. The scientists by and large want desperately to get out of the biological weapons business and didn't want to be in it to begin with. However, a number of senior *aparatchiks* do not share that view. When the Soviet Union collapsed, so did the funding for the weapons institutes. Some institutes are receiving only 5% of the funding that they received from Moscow. In the Russian winters, which are rather rigorous, they weren't even working in heated laboratories.

In 1995, it was not uncommon to find senior scientists being paid at a level of $25 to $50 per month. Some scientists had been paid less than $1 a month. In 1999, according to the World Bank, the poverty level in Russia was $37 per person needing food and clothing. Poverty-level Russians were those fortunate enough to keep their jobs. Scientists at these institutes were laid off by the thousands. In 1999 the pay for those who had managed to stay on the payroll was sporadic.

Certainly, there were those in Washington who recognized that this presented a proliferation problem. Thanks largely to Senators Nunn and Lugar and the Cooperative Reduction Program, some initiatives were begun for cooperative grant assistance to these scientists so they would be able to resist the offers from governments or terrorist groups that come their way. The funding involves four collaborative grant programs:

1. The cooperative threat reduction money, which goes to the Department of Defense and works through the International Science and Technology Center, and the Civilian Research and Development Foundation to fund collaborative research grants.
2. The Freedom Support Act, which passes through the State Department on its way to the International Science and Technology Center in Moscow and its sister organization in the Ukraine.
3. The Department of Energy's initiatives for proliferation prevention.
4. The International Science and Technology Center, which is the largest of the four grant research programs and is also funded by the European Union and a few other countries.

Biological and Chemical Institutes and Facilities of the Toxic Archipelago

Sources: International Science and Technology Center; Science and Technology Center; Ken Alibek, *Biohazard* (New York: Random House, 1999); S. Utkina, A. Gorbovsky, A. Zhuchkov, Russian Views on Conversion of Former Chemical Weapons Production Facilities, *OPCW Synthesis,* Issue 5 (The Hague, Netherlands: Organization for the Prohibition of Chemical Weapons, November/December 1999).
Note: Some sites in Russia are not listed due to map constraints. 1 chemical weapons research facility in Angarsk; 1 biological weapons research facility and 1 chemical weapons research facility in Irkutsk; 2 biological weapons research facilities in Vladivostok; 1 biological weapons storage facility in Zima.

Figure 2.

The Post-Cold War Setting

- Except Russia, "inheriting" governments caught offguard
- Yeltsin's decrees poorly implemented
- Hardline holdovers
- Drastic cuts in government funding
  —Severe personnel layoffs

Figure 3.

There are just over 1,700 projects across all four of these research grant programs. A very small portion—fewer than 70—of the projects are funded in the area of chemistry. From 1994 to 1998, a little more than 300 of those 1,700 projects were funded in the field of biology. In 1998 and 1999 we saw a slight rise in funding aimed at the biological weaponeers in the former Soviet Union. Some of the chemical and biological weaponeers are being reached under other discipline areas, such as environmental research. By and large, however, there is a skew in the funding that does not favor getting research grant assistance to the chemical and biological weaponeers.

Some headway has been made with these grants, but the scientists who receive these research grants are truly starting from scratch. They do not know how to manage grants or how to take their science from the laboratory to the commercial marketplace, and they have to be taught business practices. They also have to be taught things that many of us take for granted, such as intellectual property rights and Western standards of animal care, so that their research can apply in Western markets. In addition to giving them research grants, these programs are providing this critical training.

Some of the research institutes have begun to spin off for-profit companies, and they are beginning to produce some products for the domestic market. However, they are not making much money yet because the economy is depressed and because this is a real novel adventure for most of the scientists involved. In addition, some patents are being applied for. Thus, it is possible to see that the seeds of transformation of these institutes—from centers manufacturing weapons of war to centers of peaceful research and commercial expertise—are beginning to bear fruit, but certainly there is a long way to go.

This research illuminates four basic conclusions. First, the programs that are allotting these grants could

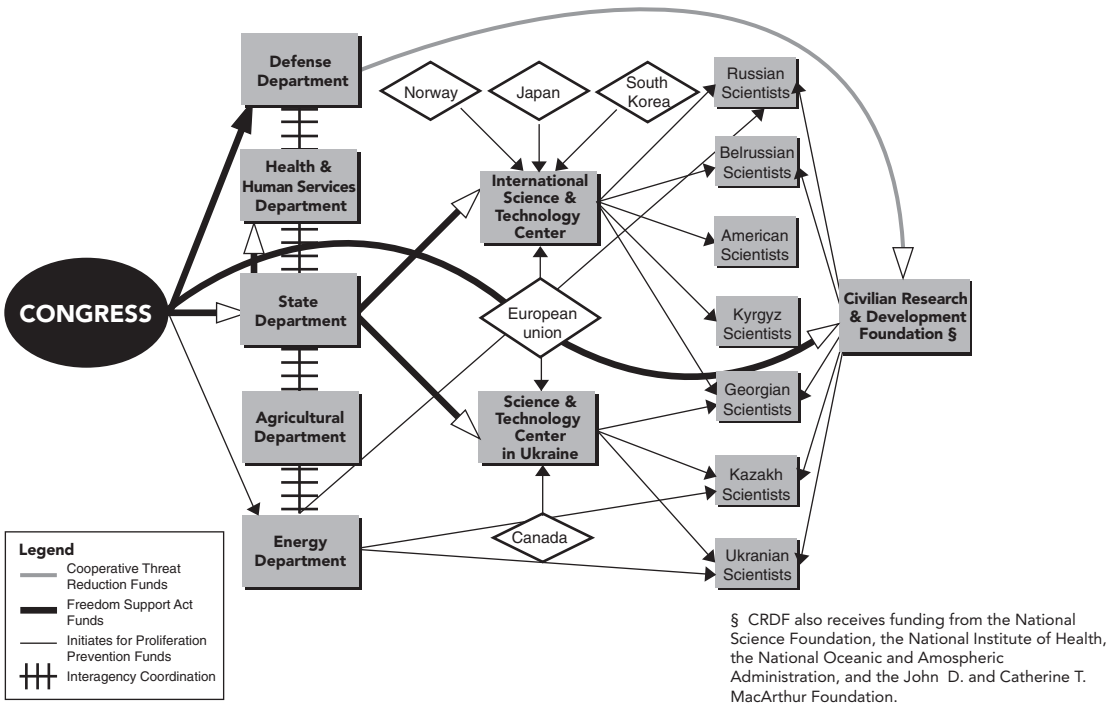
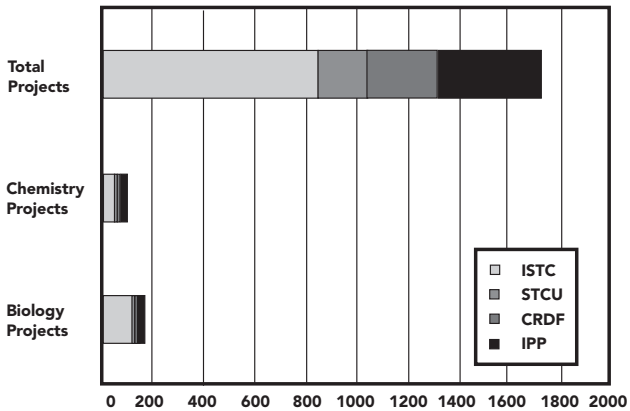


Figure 4.

Comparison of Chemistry and Biology Projects with other Technology Areas



	Biology Projects	Chemical Projects	Total Projects
IPP	29	20	413
CRDF	5	11	281
STCU	8	7	215
ISTC	136	31	824

Figure 5.

certainly do it on a faster timetable. Scientists sometimes wait more than two years to hear whether or not their application for a research grant has been approved. It is difficult to feed a family on $1 a month or $25 a month. Government review of these grant applications should be expedited.

Second, it is abundantly clear that the Putin government needs to take this issue in hand and lay off or fire the people who used to run the offensive weapons programs. In fact, the current government is in many ways thwarting the efforts to reach these scientists and give them assistance.

Third, it is also clear that the US government could be better organized to address this problem.

Fourth, the funding for these weapons scientists needs to be increased. From 1994 to 1999, the US government provided, on average, $3.5 million for biological grants. This is a small amount in the scheme of the rhetoric that has come out of Washington regarding the severity of the biological weapons proliferation threat and the possibility that these scientists could exponentially help other countries or terrorist organizations in acquiring these weapons. To reach just the conservative estimate of 7000 critical bioweaponeers a minimum increase in funding to these programs would be needed of $12.6 million per year. This amount is 0.0046% of the Pentagon's 2000 defense budget of more than $260 billion. Given the severity of the threat that these scientists represent if they are unable to support their families and resist the offers that are coming at them from places like Iran, China, North Korea, and Iraq, this seems a reasonable request.

Much more needs to be done in this regard. We have just begun to convert these facilities. This is a battle that's going to be fought institute by institute and literally scientist by scientist. In comparison to defense programs, it is relatively cheap to address the proliferation problem at its source.

A couple of figures should be kept in mind in this regard. The cost of the US Army anthrax vaccination program is roughly $130 million for more than 6 years, and that's just to vaccinate against one threat agent. The cost for research, development, testing, and deployment of new gas masks for our air and ground crews is $838 million. The total here would be a mere $12 million for the critical weaponeers. This money is a counterproliferation and counterterrorism bargain. Imagine what it would be like if we could get all of these weaponeers working on cures instead of diseases and weapons of war.

U.S. Support of Collaborative Research Grants with Chemical and Biological Weaponeers

Grant Program	Total Contribution to Grant Program (1994-1999)	Chemical Grants Total (1994-1999)	Biological Grants Total (1994-1999)	Annual Average for Chemical Grants	Annual Average for Biological Grants
ISTC	$89.9 million	$3.8 million	$13.3 million	$691,000	$2.4 million
IPP	$126.7 million	$2.5 million	$5 million	$455,000	$909,000
CRDF	$11.8 million	$550,000	$460,000	$100,000	$84,000
STCU	$21.4 million	$700,000	$800,000	$127,000	$145,000
Total	$249.8 million	$7.55 million	$19.56 million	$1.37 million	$3.54 million

Figure 7.

U.S. Funding of Chemistry and Biology Grants as a Percentage of the Defense Budget

Area of funding	Average annual U.S. Funding *(from 1994 to mid-1999)*	Average Annual U.S. Funding *(as % of U.S. Defense Budget)*	Minimum Recommended Annual Funding level	Minimum Recommended Annual Funding level *(as % of U.S. Defense Budget)*
Total U.S. Grants to Chemical Weapons Scientists	$1.37 million	0.00051%	$6.2 Million	0.0023%
Total U.S. Grants to Biological Weapons Sceintists	$3.56 million	0.0013%	$12.4 million	0.0046%

Figure 6.