

Attached is the text of the remarks I presented at the joint US-USSR CISAC meeting in Moscow, Thursday 6 June 1985. At their request, I also gave copies to Sergei Kapitsa and Nicolai Pavlovich Bochkov, and to the latter as well some of the backup material, including US news stories about Sverdlovsk etc.

At the meeting, Arbatov's response was evidently signalled by the article by Marshal Akhromeyev that appeared in Pravda June 4: there was no point discussing these technicalities when the US had not yet reached a political decision to accept equal security (parity) for the US / USSR. The emblem was SDI, which signified a US effort to achieve unilateral strategic superiority. (Previously, Sagdeev had presented an analysis of the dynamics of development of the SDI, the most likely stopping point of which would be a substantial but not comprehensive SD. At that point, he warned, the power with SD could not feel invulnerable against a first strike, but could feel safe in making a first strike, the SD providing a shield against the attenuated retaliatory force. He warned of the instability and escalation of fear this would eventuate.) Indeed, this was the main preoccupation of the meeting.

Arbatov made a point quite strongly that has concerned me, but which I preferred not to be the first to voice. If SDI is perceived as a step to superiority, and if it appears in any way credible, other powers [USSR] plainly will have to escalate their other conventional and unconventional warfare capabilities, including CW and BW.

After Arbatov, however, Batenin, Baev and Bochkov offered sympathetic and measured responses to my remarks, echoing my concern that BW would be a doomsday weapon, and expressing appreciation for my pointing out the hazards of horizontal proliferation. Baev asked why I was accusing the USSR of a treaty violation, when Sverdlovsk was a public health problem. I responded I had not voiced that accusation, but that the failure to provide satisfactory reassurances had left a very difficult evaluation on the US part; that we badly needed better forums for discourse. Baev and Markov responded that 1) I could get whatever information I needed from the public health authorities, and 2) that the US was primarily responsible for shutting off scientific discourse. They did not volunteer how to contact the public health people. Bochkov echoed my (and David Hamburg's) public health concerns about BW development.

In private conversation during and after the meeting (including at Bochkov's home), Bochkov stated that Soviet public health reports were generally as unsubstantive as what I showed him about the publication on Sverdlovsk, and I should not attribute too much malice to that one case. He offered to look for anything further that might have been published on the subject. I urged him to pursue his own information about Sverdlovsk, and he agreed he would do that. He urged me to stay in touch with him about this and other matters.

In some of these conversations, and at Bochkov's home, Kapitsa joined in. He is of course educated at Cambridge, has lived much of his life in his father's shadow, is interested in the culture of science in a depth that reminds me of Jacob Bronowski. He arranged, at short

notice, the taping of a TV interview (Kapitsa, Bochkov, Lederberg) that will be broadcast this fall as part of his educational series. This was an utterly serious discussion of the realities of human and medical genetics, that found Bochkov and myself in total agreement on matters like the genetics of IQ (but they don't test in the USSR - they know the schools differ vastly in performance), the prospects of genetic diagnosis for prenatal disease, the needs for protecting germ plasm against environmental chameicals, the general nature-nurture problem and so on. Bochkov's own national responsibility includes the organization of and training for genetic counselling; in many other ways it is congruent to my own professional role at Wisconsin (where he had visited for a semester in mid-60s) and at Stanford. So we were the most natural counterparts. He is the only M.D. on their CISAC - having been deeply involved in "Scientists/Doctors for the Prevention of Nuclear War", analogous to the US "Physicians for Social Responsibility". Bochkov is a member of the Academy of Medical Sciences, directs the Institute for Medical Genetics.

Scriabin, listed as a member of the delegation, is also a microbiologist but he was hospitalized for a heart attack.

At the meeting, Baev urged me not to take seriously the undocumented allegations from dissidents. I said that I took them only as allegations, but that in the vacuum of response it was impossible to discount them. Later, Kapitsa said he understood that.

I visited Ovchinnikov at his new institute a large part of Friday. It is the larger part of biotechnology in the USSR - a \$300,000,000 (dollars!) construction budget, 85000 sq. meters; 100,000,000 roubles annual budget, superbly equipped. It was entirely open, with a number of students from Moscow University, no remarkable security barriers. I did not however see the P2 - P3 building myself-- I should have thought to press for that. He told me there were other facilities at Pushkino about 40 km. NE of Moscow, which had their animal facilities - for monoclonal antibody work etc. Baev also does much of his work there, and invited me to visit at a future visit.

Ovch. told me he had gotten Brezhnev's personal backing to modernize Soviet biology through molecular genetics, [fairly explicitly to get over the Lysenko blight] for its indispensable values for medicine and agriculture. He was meeting that morning with agri-specialists to be setting up programs for biotech programs in that field: they were going to focus on the molecular genetics of photosynthesis - I got a garbled reference to a particular stage. Their effort is limited by people, and the difficulty of getting the best of them to work in Siberia and other remote areas where they were the most needed. They have extensive programs of first rate molecular genetics, widely published, and of which they are very proud. I see no reason to rate them 'behind' the US or anybody else: we did compare notes on our views about technological competition from the Japanese -- we agreed they were superb in the integration of their teams. Ovch. agreed that one of their problems was correlation with (and in his view quality of) the application specialists in medicine and in agriculture. The Sov. Academy is making a major push at the domestic production of reagents and scientific equipment. As he said, about half of what I saw in the labs was Soviet (or eastern bloc); but there was lots of LKB, Mettler, Beckman instrumentation. In addition, he is going to set up a foreign equipment demonstration facility (he mentioned DuPont as a cooperator) at the institute. They are proud of having manufactured interferons, and that their products are in

clinical trial for cancer, and topically for herpes and for respiratory viruses. Likewise, biosynthetic insulin.

Ovch. and his colleagues made repeated references to scientific competition with western scientists in several areas, were proud of coming out ahead in several. They were a little apprehensive that Gobind Khorana (MIT) was going to scoop them in some membrane problem because he hadn't been talking much at international meetings lately.

The word I had received was that we should 'talk strictly science' but at lunch one of his colleagues asked me what CISAC was for; and we had a lively discussion about arms control, SDI, etc. They did not seem well-informed at all; evidently have taken no part along the lines of Velikhov and Sagdeev. I summarized my presentation about BW proliferation. Several of them were incredulous that, say, an attack with typhoid would be as easy as I put out. I reminded that Leningrad water supply already had a problem with Giardia; and Ovch. said he agreed that home-brew typhoid would be easy. The group has no M.D.'s that I could see -- I don't recall, however, who is doing the hepatitis A vaccine work.

Ovch. spoke very articulately about the hazard of BW proliferation, that we should take every step to prevent microbes from being used as weapons, agreed with my demand for more discussion, said he would do everything on his part -- but again that most of the obstacles came from the US side. His colleagues knew nothing of Sverdlovsk, as an arms control issue. Ovch. said this had not been published in the USSR: [Even Science Magazine is censored; a few senior academicians, presumably including Ovch. have the privilege of uncensored copies]. Ovch. did not respond explicitly when I urged him to get authentic information himself; but he urged me to work with him to open up better scientific communication of US with USSR.

I mentioned to Ovch. (and to Baev - who had asked me where were the major US centers for DNA cloning vectors) that Goldfarb's detention, and "human rights" generally, were among the gnawing obstacles. He told me (as I had heard from other Soviet scientists) that he expected Goldfarb would soon be allowed to leave -- there were bureaucratic fowlups to which Goldfarb had contributed himself, and Goldfarb had evidently gone out of his way to antagonize Aleksandrov; but he [Ovch.] was going to straighten it out as a special case. But he thought we were misjudging the "human rights" issues. Scharansky, as far as he could tell had committed 'serious crimes', but Ovch. did not know what they were. In general, the USSR could not allow free exit, else everyone assigned an unpleasant duty would bargain to emigrate. When I asked about persecution of scientists, he said that there needed to be laws, and people who persisted in violating Soviet law were asking for punishment. His colleagues were fairly silent during this exposition, in ways that hinted they were not too content with his explanation; but only one asked the mildest of questions (about some tortured anecdote about disciplining a driver for nonfeasance). I persisted that I hoped the USSR could find a better way to deal with these problems - that they were serious obstacles to scientific communication. Baev's response to a similar remark was stony silence. Ovch. expressed a desire to continue to talk about it.

My bottom line is fairly gloomy. The new technologies that may reopen BW for the strategic conflict will come primarily from MEDICAL, not military research. During the next decade, it is US researchers who will be uncovering the biology of virulence and of host-specificity; and that publically available work will be capable of fairly prompt breakout by any side that has that intention. My 'demand' for better regulation of BW R&D matches theirs in the SDI field: we don't know feasible ways to monitor R&D. Secretive work certainly does speak to hostile (or defensive) intentions; and we would be better off were we able somehow to get to more open communication about work in the microbiological area. So we are back to CBM's; BW is an area where some good may be possible (and at least we should try to avert aggravations as we have seen in the past.) I believe this visit did communicate that message, but whether it will reach or influence real decision makers is problematical. SDI is much closer to their central concerns; as long as this remains such a burr under their saddle, they will give only marginal attention to cooperative alleviation of anxiety in the BW field.

Meanwhile the more urgent threats are from terrorism, state-sponsored or not. We did not carry conversations very far on how the US and USSR could cooperate in that field: we should be brainstorming some ideas on that.

For the US' own actions to counter terrorist BW, the best I can offer in the short run is a) as always, intelligence, and b) civil defense, which is badly neglected.

----- On a different subject, Gorbachev has just introduced restrictions on alcohol, which are taken quite seriously: they had a real impact on our official functions!

There was NOTHING in the mood of the scientists to suggest that they have the least anxiety that the USSR is collapsing economically. Their own budgets seem to be rising. Several did express the hope that Gorbachev would bring a modern outlook to the domestic economy, and seemed fairly optimistic about the future -- pace only their concerns about the deterioration of US - USSR relationships.