

# **The Past and Future of Track-2 Exchanges**

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**25 Years After Reykjavik:  
Science and Diplomacy for Nuclear Security in the 21<sup>st</sup> Century**  
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In order to guide deployment of resources and to optimize investments and calibrate expectations, it is useful to try to understand the benefits and problems, past and future of non-governmental exchanges on international security and arms control. However, this presentation is limited to bilateral discussions, and especially to one with which I am quite familiar, that between the United States and the Soviet Union, now Russia, conducted by groups with a large scientific component.

I focus on what began as the “Doty Group” and later became to some extent institutionalized under the American Academy of Arts and Sciences in Cambridge, MA, and eventually was taken up by the National Academy of Sciences at the time of the formation of the NAS Committee on International Security and Arms Control (CISAC).

The exchanges began with the realization on the U.S. side, and probably among scientists in the Soviet Union, that growing numbers of nuclear weapons on both sides and the capability to deliver them was not being matched by the mutual understanding and the command and control that would be required to avoid nuclear war by accident, inadvertence, misdirection, or intentional catalysis by another group or nation. This had, of course, been foreseen by the scientists of the Manhattan Project even before the first use of the nuclear weapon in 1945, but solutions had evaded us.

The international Pugwash movement began in 1957 with a meeting at Pugwash Nova Scotia, at the residence of Cyrus Eaton. It was attended by 22 scientists from a number of nations (seven from the United States, three each from the Soviet Union and Japan, two each from the United Kingdom and Canada, and one each from Australia, Austria, China, France, and Poland). Pugwash, in turn, was founded as a result of the 1955 Russell-Einstein Manifesto.

It was soon recognized that the diffuse membership of Pugwash diluted the intensity, capability, and urgency of focused communications between the United States and the Soviet Union, really only the two possessors of large numbers of nuclear weapons and their delivery means, and the leaders of the contending blocks of capitalism and communism. So under cover of Pugwash, and either the day before or the day after the international meeting, it became customary for U.S. and Soviet delegations to meet, and often it was only a subset of the delegations—those with particular knowledge and experience in regard to the nuclear threat.

Bernd Kubbig of the Peace Research Institute Frankfurt has chronicled the evolution of these discussions. They owe a lot in the earliest days to the initiative of Prof. Paul Doty, Professor of Biochemistry at Harvard University, as the leader of the U.S. contingent, and to Lev Artsimovitch, a highly independent and well respected scientist on the Soviet side.

Stalwarts in the U.S. group were Frank Long, Jack Ruina, George Rathjens, Jerome Wiesner, and others including myself, and on the Soviet side Vasilii Emilyanov, M. D. Millionshchikov, and, later Evgenii P. Velikhov and Roald Z. Sagdeev.

To some extent, knowledge and experience on the two sides was symmetrical, but the organization and influence of the two contingents were very different. On the U.S. side, scientists were almost entirely independent of the government, in not being government employees, but many of the U.S. scientists and engineers had high security clearances. In fact, it was understood from the very beginning that anything said at the bilateral sessions would be reported to the corresponding government, and as the interactions evolved, it became customary for the U.S. contingent or a subset thereof to meet with high officials of the U.S. government to learn what was on their mind, and what would be most helpful to understand about the views and programs of the other side.

I led one of these Washington visits, having arranged a meeting with Secretary of Defense James Schlesinger that was scheduled for 30 minutes and lasted for 90.

Henry Kissinger was, at times, a participant, and because of the close friendship between Doty and Kissinger, when Kissinger was National Security Advisor to President Nixon, and then his Secretary of State, we routinely met with him before the bilateral meetings, and also after to report. At one such meeting in his State Department office, Secretary

Kissinger commented, let's see what the Soviets have to say about this, and invited Anatoly Dobrynin, Soviet Ambassador to the United States, to step into the room to discuss this with us. The U.S.-Soviet discussions became known as SADS, for "Soviet-American Disarmament Studies."

Of course, much of the SADS interaction was informed by the 1960 Daedalus special volume on arms control, soon known as "The Bible of Arms Control," including seminal papers by Tom Schelling and others. It is particularly valuable to be able to refer, on both sides, to substantive, authoritative papers, initially primarily on the U.S. side.

Substance of the SADS discussions included the effects of nuclear weapons, defense against nuclear weapons, especially anti-ballistic missile systems (ABM), multiple independently-guided warheads (MIRV), and antisubmarine warfare—ASW.

To make a long story short, ABM was crucial to the limitation of offensive weapons, and it was necessary to enhance the understanding on both sides about the capability of potential ABM systems. At several successive SADS sessions, the U.S. team, with a lot of experience in government and in the technology of radar and interceptors, presented time and again its view of the limited potential capability. Jack Ruina had served in the Defense Department in the Kennedy and Johnson Administrations, and others, including myself, had worked with the Strategic Military Panel of PSAC, which met two days each

month and did detailed highly classified and highly technical studies of the potential evolution of ballistic missiles and ABM systems.

Jack Ruina was one of the chief expositors of ABM technology and tactics on the U.S. side, and Emilyanov with a similar position on the Soviet side.

In fact, the official Soviet position, also espoused by its contingent in these bilaterals was that defense could only be good, because it reduced the potential capability and damage from nuclear weapons. In contrast, the U.S. contingent argued that the technical facts were such that there was an enormous spread between the “offense conservative” and the “defense conservative” views of the effectiveness of ABM, so that every country would feel impelled to use the offense-conservative approach to configure and to size its strategic offensive forces, under the assumption that some future ABM system could be quite effective. One of the most telling arguments in this regard was that the United States/the Soviet Union would not be spending such vast amounts on researching and deploying ABM systems if they were judged ineffective, so that even though the analysis might show that defense systems could readily be overcome, one had to plan as if they could not.

At the same time, those building defensive systems were all too aware of the limitations of these systems, and had to plan for their being overwhelmed, under flown, or outmaneuvered.

But particularly in a democracy, these views of the inadequacies of defensive systems could not be openly expressed by their proponents or by the government, because the funding for the system would be imperiled. So the assessment was unnecessarily murky until outside scientists were capable of discussing such matters with the President (usually through his National Security Advisor) and the Secretary of Defense. Key to this was their being invited to provide these views and their being granted access to the relevant unfiltered information.

From the 1960 Daedalus volume and the analysis of the time came the concepts of crisis stability and arms race stability. Crisis stability involved forces in being at any time. In response to a rumor, a small strike, or an accident, constituting a crisis, would the situation be “stable,” in that when the option of using nuclear weapons for a first strike was considered, the answer would be “No.” Or would the situation be unstable, so that each side (or even one side) would believe that its strategic offensive forces would be destroyed by the first strike of the other side, so that national survival depended on its striking first?

Arms-race stability had nothing to do with the actual use of nuclear weapons but rather the view of each side toward the future. If each side felt that the situation of possessing and controlling nuclear weapons would become unstable in the future, it might insist on building more or new types of nuclear weapons, or changing the command and control structure in such a way that an arms race would develop.

In principle, an arms race might be stabilizing, but a large fraction of so-called phase space is occupied by trajectories that lead to greater offensive forces, perhaps greater defensive forces of uncertain effectiveness, and to provide the ultimate “stability,” to the deployment of systems for launch on warning of nuclear attack.

I don't know whether the American Academy became somewhat disaffected with sponsoring the Doty Group or SADS, or whether a previously unresponsive National Academy was persuaded to take it up, perhaps by David Hamburg, soon to become head of the Carnegie Foundation in New York.

In any case, NAS CISAC—Committee on International Security and Arms Control-- was created to carry on this bilateral discussion with Soviets, in a group that was, ideally, half scientists and half retired military officers of General and Flag rank. The original CISAC chair was Marvin (Murph) Goldberger, succeeded by W.K.H. (Pief) Panofsky,



John P. Holdren, and now Raymond Jeanloz. CISAC has been a very special Committee of the NAS, not of the NRC (National Research Council).

In order to carry out these bilaterals effectively, initially only with the Soviet Union (eventually Russia) but also beginning about 1988 with China and more recently with India, it was necessary that CISAC members have long terms. About half the scientists were members of the National Academy of Sciences, National Academy of Engineering, or Institute of Medicine (collectively making up “The National Academies of Science.” The military contingent was, numerically, often not up to the 50% desired.

Created for knowledgeable, impactful dialogue with the Soviets, CISAC needed first to reach informed judgments on national security and military technology, strategy, tactics, and non-military—e.g., arms-control interactions. CISAC needed to be expert on national intelligence capabilities and concerns—not just military intelligence to fight a war if such broke out, but to understand the intentions and capabilities of the other side and to judge whether war would be in the U.S. interest. CISAC members such as Bill Perry, General Lew Allen (USAF, retired), Al Flax, and currently Admiral Richard W. Mies (USN, retired, former commander of the US Strategic Command) provided specific knowledge and wisdom in these fields.

The international security relationship can be imperiled by misunderstandings—for instance, the existence of WMD in Iraq in 2003, which in fact did not exist. Similarly, misinterpretation of intelligence reports of fantastic new weapons (on both sides) can destabilize the international situation.

An example is space-based strategic defense discussions in 1983, just before the March 23 SDI speech of President Ronald Reagan. By that time Soviet CISAC was led by Evgenii Velikhov, with Georgii Arbatov, Roald Sagdeev and Yevgeny Primakoff important contributors. Sagdeev and I took the lead in these discussions, which included technical analyses of various orbiting directed energy weapons-DEW, and some attention to the phrasing of potential arms control agreements that would permit such obviously harmless and potentially productive instruments such as an exceedingly high power (but short pulse) laser that could be used for sampling the lunar regolith from a low-altitude lunar orbiter.

You might wonder about the reaction of our Soviet counterparts a week later to President Reagan's "Star Wars" speech of March 23, 1983. It was one of surprise and perhaps even suspicion that CISAC members had not been candid about their analyses of the potential of space-based defenses. I do think that such doubts were soon resolved and that we were all fortunate that when Mikhail Gorbachev rose to the position of General Secretary in the Soviet Union, his attempt to bring in sound and independent technical

advice led him to depend on Velikhov, Arbatov, Sagdeev, and Primakoff, with whom CISAC had good contact and mutual respect.

Although CISAC and its Soviet and later counterparts rarely issued joint papers or statements, the activity did lead directly to a Joint US-Russian Plutonium Disposition Study and the Holdren-Velikhov Commission, but with results less than we had hoped.

With diminished contact between CISAC and the US administration during the Ronald Reagan presidency, CISAC turned to providing a basis for future arms control and reduction possibilities, producing these reports, of which I have highlighted those I think are the most significant,

- **Update of 2002 CISAC report on “Technical Issues Related to the Comprehensive Nuclear Test Ban Treaty” (in progress—2011)**
- **Monitoring Nuclear Weapons and Nuclear Explosive Materials: An Assessment of Methods and Capabilities, 2005**
- Strengthening U.S. - Russian Cooperation on Nuclear Nonproliferation: Recommendations for Action, 2005\*
- Overcoming Impediments to U.S. - Russian Cooperation on Nuclear Nonproliferation: Report of A Joint Workshop, 2004\*
- Technical Issues Related to the Comprehensive Nuclear Test Ban Treaty, 2002\*
- The Spent-Fuel Standard for Disposition of Excess Weapon Plutonium: Application to Current DOE Options, 2000\*
- **The Future of U.S. Nuclear Weapons Policy, 1997**
- Controlling Dangerous Pathogens: A Blueprint for U.S.-Russian Cooperation, A Report to the Cooperative Threat Reduction Program of the U.S. Department of Defense, 1997\*

- U.S.-German Cooperation in Elimination of Excess Weapons Plutonium, 1995\*
- Management and Disposition of Excess Weapons Plutonium--Reactor-Related Options, 1995\*
- Management and Disposition of Excess Weapons Plutonium, 1994  
(Executive summaries and Russian translations of the Executive Summary are also available from CISAC)
- **The Future of the U.S.-Soviet Nuclear Relationship, 1991**
- Challenges for the 1990s for Arms Control and International Security, 1989
- Reykjavik and Beyond: Deep Reductions in Strategic Nuclear Arsenals and the Future Direction of Arms Control, 1988
- Crisis Management in the Nuclear Age, 1987
- Nuclear Arms Control: Background and Issues, 1985

For the future, Track-2 discussions need to compete for attention and resources with the increasingly strengthened governmental interest and capabilities in carrying out discussions with similar content. But it is essential to explore possibilities beyond those already set as policy by the governments, as emphasized by Bill Perry.

So the agenda for CISAC might include

- Understanding and limitation of space weapons and destructive antisatellite tests.
- Monitoring and limitation of tactical nuclear weapons.
- Technical means for ensuring delay in use of nuclear weapons and analysis of influence on stability of nuclear forces at declining levels.
- The degree to which technological choices can reduce the availability of nuclear-weapon-usable materials to terrorist groups.
- Potential for cooperation and joint operation of defensive systems.
- Test-site transparency for mutual understanding beyond the CTBT.

These all can be related to the 1960 Daedalus “Arms Control” volume and have been mentioned in CISAC discussions. But we need now to think constructively about the technical aspects of providing security in a world without nuclear weapons. We need to have the imagination to consider what is widely regarded as “impossible”. And we need to pay attention to the “minor” matters of visas and funding for these exchanges.