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Gerson S. Sher. *From Pugwash to Putin: A Critical History of US-Soviet Scientific Cooperation.* Bloomington: Indiana University Press, 2019. 318 pp. $40.00, paper, ISBN 978-0-253-04262-0.

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Enemies, in principle, can cooperate. Sometimes they have an important common interest, or a third enemy that allows them to partially set aside their bilateral conflict. Sometimes, both of them hope to gain something from communication with the rival in the midst of an ongoing struggle. Whether such circumstances should still be called "cooperation," or a "compromise," or "trading," the history of US-Soviet scientific contacts combined propagandistic showcasing, reciprocal intelligence gathering, back-channel diplomacy, and genuinely common research projects. At the height of the Cold War, much as they disagreed on other parts of their respective value systems, both the Soviets and the Americans shared a similarly strong ideological commitment to scientism and claimed, at least for public posturing, that their mutual cooperation aimed to help the progress of international science and humanity.

Actors involved in this area of foreign relations were similarly diverse. Contrary to Randolph Bourne's famous mantra, "War is the health of the State," they did not represent a uniform, single-willed ideal of the state, but a motley variety of more or less governmental agents with often incongruent agendas and commitments. A scientist, for example, could sincerely collaborate with foreign colleagues in a joint project while also appropriating their professional secrets and know-how for further use back home, and also being debriefed by security agents as a source of intelligence.

Gerson S. Sher played a key role as coordinator and enabler of many such encounters over the course of four decades, starting in the mid-1970s when as a young PhD student of Russian language and culture he obtained an entry-level job in the office of East-West scientific exchanges at the National Academy of Sciences in Washington, DC. Rising through the ranks, he continued organizing similar programs even after the dissolution of the Soviet bloc, while also switching between governmental and nongovernmental offices. He retired after 2014, when even the nominal cooperation between American and Russian agencies came to an almost complete halt. His "Critical History of US-Soviet [and post-Soviet] Scientific Cooperation" is part participant memoir, part sober reflection on the efforts made, their successes and failures, and part organized summary of about fifty oral history interviews which he conducted with former participants (scientists, diplomats, negotiators, and intermediaries).

While Sher's analysis certainly cannot claim the level of impartiality and sufficient distance from the described events to become critical in the full sense of the term, the author does make a sincere and serious effort to sound detached, reflect-

ive, and not at all triumphalist. The time when he was writing the book did not permit a congratulatory mood anyway, with the dominant paranoid atmosphere in Washington viewing any hint at cooperation with the Russians through a McCarthy-style suspicion and hysteria. The attitude in Moscow was not much better either, at least regarding US-Russian relations and scientific contacts after 1991. By 2019, when the book was published, not only had both sides stopped even talking about a possible resumption of scientific cooperation, but the most basic diplomatic relations between the two countries seemed on the verge of total breakdown. Sher's "Critical History" thus also became a nostalgic remembrance of an era when, despite Cold War tensions, the adversaries were still capable of maintaining a degree of civility and sanity, in a striking contrast to the mores of today.

Sher's own lifelong trajectory in public and government service provides a case in point. He qualified for his job, initially, through a love of Russian literature and culture, command of the area's languages, and a scholarly interest in the Yugoslav variety of Marxist humanism. No scientific expertise was required. But neither was a mastery of hate speech and paranoid propaganda, the sine qua non qualifications of Russia experts by the time Sher retired from civil service forty years later. While his superiors in governmental agencies and political cabinets had to be committed to the adversarial Cold War agenda, field officers such as Sher could combine their official obligations with more idealistic and constructive goals. This productive tension proved conducive to the similarly contradictory nature of their mission: to maintain at least a modicum of shared interests and cooperation against the background of political and ideological confrontation. Science was a field where such positioning was possible.

The book's narrative starts in the 1950s, even though the history of US-Soviet scientific and technological cooperation long preceded the Cold War, Pugwash, and Sputnik. Arguably the most influential in the long run, transfers of knowledge, expertise, and technology occurred before the USSR and the USA became one another's best enemies. Even despite the lack of formal diplomatic relations until 1933, such transfers often succeeded via private channels, trade, immigration, and hired experts. Official contacts intensified during Roosevelt's New Deal and especially in the early 1940s, when the two countries became political and military allies. Some of the crucial scientific and technological communications were sanctioned by the WWII-era governments, including the joint US-British-Canadian medical mission to Moscow in 1944. Other knowledge flows, such as the transfer of nuclear secrets, went through clandestine intelligence channels, because not only can enemies cooperate, but also allies can engage in friendly espionage. Almost all such contacts, permitted and unpermitted, effectively closed by 1950, due to spiraling Cold War hostility, with its uncontrolled spy mania and paranoid vigilance on both sides. Sher's story begins around that moment when US-Soviet relations, including scientific ones, were almost completely broken. He describes their difficult and partial revival, with ups and downs, through the latter part of the Cold War, their subsequent reorganization with post-Soviet US-Russia agreements, and ends at another moment of their almost total dismantling by 2018.

In the previous situation of such a dangerous dysfunction, scientists interfered with a message that the Cold War was too important to be trusted to politicians and diplomats. If the latter seemed unable or unwilling to achieve any mutual understanding, the 1955 Einstein-Russell manifesto appealed to scientific representatives from various nations to establish the minimally required degree of communication and agreement to prevent the thermonuclear annihilation of the entire human species. Heeding their call, and supported by private donors, a small international group of influential scientists gathered in the Canadian village of Pugwash in 1957 to discuss the problems of global survival. The political establishment re-

quired an additional powerful kick, which came later the same year with the shocking launch of Sputnik. In January 1958, American and Soviet government representatives signed the so-called Lacy-Zaroubin agreement to enable regular cultural, technical, and educational exchanges and to temper the continuing Cold War with a modicum of science diplomacy.

The resulting exchanges, coordinated by the two respective Academies of Sciences, reflected the awkwardness of the political situation. The interests of research and of participating scientists were often secondary to bureaucratic red tape, the diplomatic protocol of strict reciprocity, and the very ritual of maintaining a semblance of cooperation between the two arch adversaries. As a barometer of political relations, exchange programs expanded during the détente of the early 1970s and shrank severely a decade later, when American lawmakers thought that by placing sanctions on collaborative research, they would be able to win some political concessions from Soviet leaders. It is likely, however, that the two countries' most important scientific contacts throughout the Cold War were happening via international venues not covered in Sher's book: organizations such as UNESCO and the International Atomic Energy Agency, expert negotiations on nuclear safety and nonproliferation, the World Health Organization (in particular, the eradication of smallpox), global geophysics and environmental protection agreements, and joint projects in space and astronomy.

The other major factor besides the whimsical ups and downs in foreign relations was the prestige and authority of science and scientists, generally on the decline from about 1960 onward. In the Soviet Union, this trend developed much more slowly, at first, but then accelerated greatly and turned into a free fall with the end of communist rule in 1991. During the 1990s, post-Soviet authorities were busy dismantling half of the country's R&D infrastructure, investment, and personnel, assisted by the slogans of "reform" and advisers who hoped to model academic institutions on American examples. Meanwhile, international exchanges shifted largely to the mode of emergency assistance and brain drain. Sher worked as the chief operating officer at George Soros's International Science Foundation, which provided over $100 million in research grants to scientists in the former Soviet republics. He then became the founding president of the US Civilian Research and Development Foundation (CRDF Global) with the mission to convert Soviet expertise in military R&D toward civilian goals. Politically, the program was justified by the imagined fear that unemployed Soviet weaponry makers could defect to "rogue countries." No matter how often that official mantra was proclaimed, such a possibility did not look very believable. Later, this gave US politicians ample pretexts to engage in their favorite rhetoric of unfair trade and claim that, as in earlier collaborative research programs, it was the other side who profited from the American expenses and expertise. Russian politicians, of course, claim exactly the opposite, that it was mainly the US side that gained cheap access to valuable Russian military and scientific secrets.

Sher acknowledges these political critiques but does not want to support either of them. The second part of his book contains interesting stories of many actual participants—summaries and long excerpts from oral history interviews with those who received collaborative grants and were actively involved for some time in US-Soviet or post-Soviet research projects. The material is organized according to several general rubrics and questions: What motivated scientists to collaborate across the Cold War divide? What kept their projects going despite unavoidable political, logistical, and cultural difficulties? What were the main scientific accomplishments, problems, and failures? What have their experiences revealed about the nature and specificity of Soviet and post-Soviet science? Was the collaboration worth it, and what should one make of it all? As one of the key parti-

cipants, Sher grapples with these questions himself, but also presents alternative voices.

The tense political situation did not allow him to include the voices of scientists who had continued their research careers in Russia. Sher's respondents comprise several former collaborators or diplomats from the American side, several former Soviet scientists who now live and work in the US, and several participants from Georgia and Ukraine. Typical for the oral history genre, the information is not always verifiable; respondents may disagree, contradict one another, or express some stereotypes and common prejudices. But they also relate many extremely interesting observations, recollections, and details that cannot be obtained from other types of historical sources, including stories of successful personal contacts and collaborations in which the combination of Soviet and American or British insights led to important discoveries or innovations, from fundamental research to material technology and know-how.

For example, a meeting between Yakov Zeldovich and Stephen Hawking during the latter's visit to Moscow in 1973 allowed the discovery of black hole radiation. Unfortunately, neither of the two are still alive, but their younger colleagues from the time, Kip Thorne and Alexei Starobinsky, are, and Thorne was interviewed for Sher's book. Another story told by him concerns an early Soviet proposal for the experimental method to detect gravity waves that eventually became the Laser Interferometer Gravitational-Wave Observatory (LIGO), the largest research project ever supported by the National Science Foundation. A detailed interview with the late Vladimir Braginsky, the main Russian collaborator and contributor to the LIGO experiment, was published in Russian in 2007. These and additional existing sources can provide a basis for future investigations into the history of one of the latest and most important discoveries in fundamental science. Hopefully, the full collection of Sher's interviews will be deposited in some appropriate archive, for the rich material he created in the course of this project is highly valuable for researchers and offers a unique and revealing window into the comparative history and anthropology of Cold War science.

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