Sakharov and the Nuclear Test Ban

BY HERBERT YORK

Since 1958 it has been the stated policy of both the United States and the USSR to achieve a treaty that would ban all nuclear weapons tests. Andrei Sakharov, we now know, played a major, perhaps crucial, role in this matter. And several American scientists, including myself, played a role in establishing and carrying out U.S. policy in this same regard. During the formative period of the late '50s and early '60s we had no idea who Sakharov was or what he was doing. I believe if we had, we would have done a much better job, but the ever-present curtain of Soviet secrecy prevented it.

The policies of both countries in regard to a test ban grew out of two quite distinct origins. One was the belief that the nuclear arms race was a grave threat to mankind. The other was a narrower (and shallower) but much more widely shared concern about the dangers posed by the radioactive fallout produced by nuclear weapons tests.

Concern about the nuclear arms race dated from World War II: the Bohr memorandum; the Szilard petition; the declaration by Harry Truman, Clement Atlee, and MacKenzie King in Washington in December, 1945; the proposals by Oppenheimer, Lilienthal, and others that eventually became the Baruch Plan—all are early manifestations of this profound concern. Early proposals for solutions to the problem were generally very broad in nature: Some called for the internationalization of the atom and the total elimination of nuclear weapons; others were even broader and called for general and complete disarmament. The extreme nature of these proposals, as well as the generally worsening political situation in the late '40s and early '50s, rendered them unachievable.

Concern about the fallout problem dates largely from the "Bravo" nuclear test of March 1, 1954. The test involved the largest nuclear explosion to that date—fifteen megatons—and, because of a slight shift in the wind, it resulted in a fallout pattern that placed lethal and near-lethal levels of fallout on and near a Japanese fishing vessel, the *Fortunate Dragon*, and a number of inhabited islands. Only one person died as a result, but a further slight shift in this pattern would have killed hundreds.

There was a worldwide antitest and antiwar reaction, of which Linus Pauling was an intellectual leader. Others were Albert Schweitzer, and the small group that signed the Russell-Einstein manifesto calling for the abolition of war but implicitly referring to this specific fallout incident as its immediate stimulus. The fallout issue even directly entered into the 1956 U.S. presidential campaign, when Adlai Stevenson drew attention to the problem and endorsed the idea of eliminating nuclear tests.

The interplay of these two distinct sets of ideas—concern over the nuclear arms race and concern over fallout from nuclear tests—was nurtured by the general improvement in climate after the death of Stalin and eventually led to the idea of a test ban as a separate and feasible "first step." Serious study of that particular approach was initiated in both the East and West.

In Washington, President Eisenhower turned to his Science Advisory Committee in 1958 just after it was enlarged and its status elevated as one of the responses to Sputnik. Would a nuclear test ban be in the best interests of the United States, he asked; and could a test ban be monitored adequately? I was a member of that committee and our conclusion was a tentative yes to both questions.

As a result of that deliberation and further studies in Washington, a bilateral Conference of Experts was held in Geneva in the summer of 1958. This conference produced the outlines of a verification system, and in the fall of that same year a Political Conference assigned the task of producing a formal treaty was opened and a moratorium on all nuclear weapons tests was instituted to create the proper climate for working out a treaty.

On our side, many on the negotiating team or backing it up at home were people who were or had been directly involved in nuclear weapons development (Hans Bethe, Harold Brown, Ernest Lawrence, and myself, among others). None of the Soviets with whom we dealt directly seemed to have such close connections to their weapons program. We know now, however, that major participants in the Soviet program were very much involved. In this regard I quote from *Sakharov Speaks*:

Beginning in 1957 (not without the influence of statements

Herbert York is Professor of Physics and Director of the Program in Science, Technology, and Public Affairs at the University of California, San Diego. His most recent book is The Advisors: Oppenheimer, Teller and the Superbomb *(W. H. Freeman & Co.).*

on this subject made throughout the world by such people as Albert Schweitzer, Linus Pauling, and others) I felt myself responsible for the problem of radioactive contamination from nuclear explosions. As is known, the absorption of the radioactive products of nuclear explosions by the billions of people inhabiting the earth leads to an increase in the incidence of several diseases and birth defects, of so-called sub-threshold biological effects—for example, because of damage to DNA molecules, the bearers of heredity. When the radioactive products of an explosion get into the atmosphere, each megaton of the nuclear explosion means thousands of unknown victims. And each series of tests of a nuclear weapon (whether they be conducted by the United States, the USSR, Great Britain, China, or France) involves tens of megatons, i.e., tens of thousands of victims.

In my attempts to explain this problem, I encountered great difficulties—and a reluctance to understand. I wrote memorandums (as a result of one of them I. V. Kurchatov made a trip to Yalta to meet with Khrushchev in an unsuccessful attempt to stop the 1958 tests), and I spoke at conferences.

The book from which that quotation comes was published well after the events, and then only in the West. But it turns out that there was at least one contemporary source—*Soviet Scientists on the Danger of Nuclear Testing* (Moscow, 1960)—that basically confirms what Sakharov said. In it we find a statement by Kurchatov, the scientific head of the Soviet Nuclear Weapons Program since the early 1940s, and an essay by Sakharov, both of which touch on the issue. Wrote Kurchatov:

> When the war was coming to a close...United States aircraft dropped two atomic bombs on the Japanese towns of Hiroshima and Nagasaki, killing over 300,000 persons....
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> The United States military politicians took advantage of these bombings to launch on a course of "power politics" against the U.S.S.R.
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> Soviet scientists regarded it as their sacred duty to ensure the safety of their country, and, under the day-to-day guidance of the Party and Government, together with the entire nation, they achieved outstanding success in the building of atomic and hydrogen weapons. Now, he who dares take the atomic sword against the Soviet people shall perish with this sword.
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> But the very thought of nuclear warfare is horrifying. We scientists working in the field of atomic energy see more clearly than anyone else that a war with atomic and hydrogen weapons would inflict incalculable suffering on humanity.
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> ...Our scientific community has unequivocally called for a ban on nuclear weapons. This is also the stand taken by such world-famous scientists as Niels Bohr (Denmark), Linus Pauling (the United States of America), Heisenberg (Germany), Yukawa (Japan), Powell (Great Britain), the late Joliot-Curie (France), and many others.
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> Tests of atomic and hydrogen weapons not only hold the world in the grip of constant anxiety as the portent of a possible future atomic war, but are (and in future will be still more) a hazard to the health of humanity....

While Kurchatov and other contributors couple their basic appeal for restraint with "required" anti-American statements, the Sakharov essay totally ignores this bow to official polemics:

> One of the arguments of those who support the theory of "harmlessness" of nuclear tests is that cosmic rays produce larger doses of radiation than do the tests. But this argument does not eliminate the fact that added to the existing distress and death of human beings are the death and distress of hundreds of thousands more, and these include people in neutral countries and in future generations. Two world wars also added less than 10 per cent to the death rate in the twentieth century, but this fact does not make wars a normal occurrence.
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> Another widespread argument in the literature of a number of countries is that the progress of civilization and the development of technology lead to loss of human life. A common example used is automobile accidents. But the analogy here is neither exact nor justified....
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> The cessation of test explosions will preserve the lives of hundreds of thousands of people and will have a still greater indirect effect by helping to lessen international tension and to reduce the possibility of a nuclear war—the greatest danger of our age.

SAKHAROV AND KHRUSHCHEV

The moratorium was denounced in early 1960, first by Eisenhower and then immediately after by Khrushchev. Eisenhower's reason was that originally it had been intended to run for only a year, during which time a formal treaty was supposed to be completed. Yet despite these denunciations the remarkable fact is that it continued in effect for another year and a half. As far as the West was concerned, the main reason for the continuation of the moratorium was Eisenhower's deeply felt view that it was essential to find a way somehow to contain the nuclear arms race and that a nuclear test ban could contribute to that goal. He was greatly supported in this controversial policy by George Kistiakowsky, then his science advisor, and also by James Killian, Jerry Wiesner, myself (I was then head of all research and engineering in the Pentagon), and others.

The moratorium also continued in effect for some time in the USSR, but in the summer of 1961 the Soviets took the initiative in ending it, after almost three years, with a long series of nuclear tests, followed some months later by an American response in kind.

What was going on in the Soviet Union during the moratorium? I turn again to *Sakharov Speaks*:

> I remember that in the summer of 1961 there was a meeting between atomic scientists and the chairman of the Council of Ministers, Khrushchev. It turned out that we were to prepare for a series of tests that would bolster up the new policy of the USSR on the German question (the Berlin Wall). I wrote a note to Khrushchev, saying: "To resume tests after a three-year moratorium would undermine the talks on banning tests and on disarmament, and would lead to a new round in the armaments race—especially in the sphere of intercontinental missiles and anti-missile defense." I passed it up the line, Khrushchev put the note in his breast pocket and invited all present to dine. At the dinner table he made an off-the-cuff speech that I remember for its frankness, and that did not reflect merely his personal position. He said more or less the following: Sakharov is a good scientist. But leave it to us, who are specialists in this tricky business, to make foreign policy. Only force—only the disorientation of the enemy. We can't say aloud that we are carrying out our policy from a position of strength, but that's the way it must be. I would

be a slob, and not chairman of the Council of Ministers, if I listened to the likes of Sakharov.

A confirmation of Sakharov's views, but from a very different perspective, is supplied in *Khrushchev Remembers*:

> ...Literally a day or two before the resumption of our testing program, I got a telephone call from Academician Sakharov. He addressed me in my capacity as the Chairman of Council of Ministers, and he said he had a petition to present. The petition called on our government to cancel the scheduled nuclear explosion and not to engage in any further testing, at least not of the hydrogen bomb....
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> My arguments didn't change his mind, and his didn't change mine; but that was to be expected. Looking back on the affair, I feel Sakharov had the wrong attitude. Obviously, he was of two minds. On the one hand, he had wanted to help his country defend itself against imperialist aggression. On the other hand, once he'd made it possible for us to develop the bomb, he was afraid of seeing it put to use. I think perhaps he was afraid of having his name associated with the possible implementation of the bomb. In other words, the scientist in him saw his patriotic duty and performed it well, while the pacifist in him made him hesitate....
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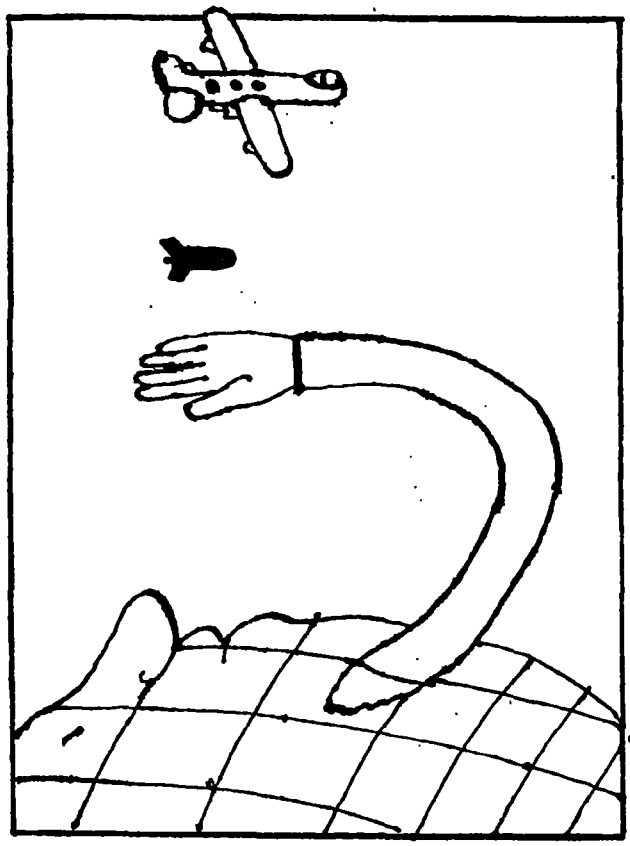
> This conflict between Sakharov and me left a lasting imprint on us both. I took it as evidence that he didn't fully understand what was in the best interests of the state, and therefore from that moment on I was somewhat on my guard with him.

GOING PUBLIC

After the resumption of testing, the world situation took several surprising turns, the most critical of which was the Cuban missile crisis. The nuclear scare that grew out of this crisis stimulated a renewed effort to contain the nuclear arms race, and the Limited Nuclear Test Ban of 1963 resulted the very next year. This treaty, in effect finessed what had been one of the main blocks to accomplishing a treaty earlier: the especially difficult problem of monitoring a ban on underground tests. We now know that Sakharov personally played a role in breaking this particular bottleneck:

> ...[R]adioactive contamination is caused only by explosions in the atmosphere, in space, and in the ocean. Therefore, limiting the agreement to banning tests in these three environments would solve both problems (contamination and monitoring). It should be noted that a similar proposal had previously been made by President Eisenhower, but at the time it had not accorded with the thinking of the Soviet side. In 1963 the so-called Moscow Treaty, in which this idea was realized, was concluded on the initiative of Khrushchev and Kennedy. It is possible that my initiative was of help in this historic act.

The moratorium of 1958-61 and the Limited Test Ban of 1963 did lead to a large reduction in the radioactive pollution of the atmosphere (French and Chinese tests continued, but at a much lower level), and they were also successful as a first step in the total attempt to contain the nuclear arms race. Other arms control treaties did indeed follow: The Ban on Weapons of Mass Destruction in Outer Space, the Non-Proliferation Treaty, SALT I, SALT II, and others were in fact built on the precedents created in working out the moratorium and the Limited Test Ban.



Douglas Florian

In the years since these events Sakharov has gone public with his effort to slow and reverse the nuclear arms race. In his "Letter From Exile" published in the *New York Times* in 1980, we find him writing:

> Despite all that has happened, I feel that the questions of war and peace and disarmament are so crucial that they must be given absolute priority even in the most difficult circumstances. It is imperative that all possible means be used to solve these questions and to lay the groundwork for further progress. Most urgent of all are steps to avert a nuclear war, which is the greatest peril confronting the modern world.

If we compare what has been accomplished to the difficulty of doing anything, we can say that much has been achieved. But if we compare what has been done to the need and to the danger, we must admit that what we have achieved is nowhere near adequate. During the Carter administration the effort to achieve a ban on all nuclear tests was given new life, and other similar initiatives were undertaken. In the final accounting, however, nothing resulted. The forces of reaction in both capitals proved to be too powerful, and they fed on each other with the result that the forward momentum of the process had been largely lost even before Afghanistan and the last U.S. elections. But despite the setbacks and the sorry record, we must resolve to continue the work to contain nuclear arms begun by Robert Oppenheimer, Leo Szilard, Andrei Sakharov, and so many other noble figures in both the East and the West. WV