

SCIENTIST, THINKER, HUMANIST

Even in 1950, when this very quiet and shy young man first caught the author's attention, a bright future was seen for Andrei Dmitrievich Sakharov.

Vitalii I. Goldanskii

I cannot say that I knew Andrei Dmitrievich Sakharov well, so this will be a view of him from off to the side, so to speak.

It was 1950, in Dubna, when I first saw Sakharov. I was working at the first of the Dubna accelerators at the time. One day, while a management team headed by Igor V. Kurchatov was visiting the place to get a look at the experimental results, a very quiet and shy young man caught my attention. When I asked some acquaintances who he was, I was told, "Sakharov, candidate in sciences from the Lebedev Physics Institute." I was advised to remember his name, since even at the time a very bright future was seen for him.

At a seminar, the leaders of the various groups working at the accelerator spoke about what they were doing. I was one of these speakers, representing my colleagues in the Institute of Chemical Physics. After the seminar, Sakharov walked over and said some kind words about our work, but I sensed that he was saying much the same thing to almost all the speakers. That was the style of his generosity: Very polite and attentive, Andrei Dmitrievich strived to emphasize the positive aspects of his impressions.

In 1953 I heard that Sakharov had defended his doctoral dissertation. The defense had been specially organized on short notice. The reason for the hurry was that elections to the Academy of Sciences were to be held that same year, and Sakharov was to be promoted to the rank of full member of the academy. Although no one doubted that eventually he would go far above the doctoral level, it was important to observe the formality: It would have been a bit awkward to elect a person without a doctorate to the top rank of academician. To the best of my memory he received 23 of the 23 votes from his own department.

In 1961 our paths crossed at a Crimean resort, where Andrei Dmitrievich was taking a vacation with his children. Beyond the very ordinary conversations that all

Soviet chemist and physicist **Vitalii Goldanskii** is Director of the N. N. Semenov Institute of Chemical Physics of the USSR Academy of Sciences, People's Deputy of the USSR, Member of the Supreme Soviet committee for foreign affairs and chairman of the Soviet Pugwash committee. His main scientific contributions are in the fields of chemical kinetics, tunneling phenomena in chemistry, nuclear chemistry and biochemical physics.



Andrei Dmitrievich Sakharov, "a very quiet and shy young man," in 1950. (Courtesy of Elena Bonner.)

the guests had, I did not talk with him. I was not alone in this regard: I do not recall that my father-in-law, the physicist Nikolai Nikolaevich Semenov, who was also there, spent much time with Sakharov. It may have been that contact with him was discouraged by the thick air of secrecy about him—I had been hearing since 1953 that he was the creator of the hydrogen bomb.

Speaking against nuclear testing

It was also in 1961 that I learned of an action by Sakharov that attracted publicity. Since 1958 our country had been observing a moratorium on nuclear testing, as had the US. In 1961 we were the first to resume testing, offering the ob-

viously contrived excuse that France was said to have been carrying out tests. In fact, this was a raw show of force. By that time Sakharov had developed a most powerful hydrogen bomb, whose explosive power—about 60 megatons—has not since been surpassed. When he learned of the decision to explode the bomb on Novaya Zemlya, Sakharov launched a very vigorous protest against the test.

Sakharov had spoken out against nuclear testing before, but never had his protests been so categorical. He probably felt that these tests imposed a particular responsibility on him. In addition he understood the absurdity of such a nuclear explosion. Such a gigantic explosion was meaningless, even from a military standpoint, since its energy would not have a corresponding destructive effect. The energy would go mostly into the atmosphere, which would then become severely contaminated with radioactive products. From an ecological standpoint, such a powerful explosion would be exceedingly harmful. Sakharov fought to prevent the explosion, arguing his case all the way to the top.

Sakharov was unable to prevent the explosion, but he apparently succeeded in causing the military to start looking at him with suspicion: Here was a man doing some overly independent thinking. His job was viewed as that of simply creating the weapon; beyond that, his advice was not needed—or wanted.

I saw Sakharov engaged in verbal combat in 1964, at a general meeting of the Academy of Sciences of the USSR. At this meeting nominees for academician and corresponding member chosen by the various departments were to be confirmed. The department of general biology had selected Nikolai I. Nuzhdin—one of the closest colleagues of Trofim D. Lysenko—for promotion to academician. The debate over Nuzhdin's candidacy, which drew in Sakharov, Igor E. Tamm, Vladimir A. Engelhardt and Vladimir N. Sukachev, among others, began with some seemingly innocent questions: How many papers had he published? Why had these papers been published for the most part in popular magazines? And so forth. However innocent they may have seemed, these questions and the members' speeches exposed the antiscientific essence of Lysenko's "theories." Particularly sharp and uncompromising was the speech by Sakharov, who directly attacked not only Nuzhdin but also Lysenko. The results of the vote humiliated the Lysenkoites: Nuzhdin received only 14 of about 120 votes.

This was the first time a general meeting of the academy had ever failed to confirm a candidate selected by a department. Because Lysenko was at that time back in good standing with Premier Nikita Khrushchev after a brief fall from grace, these election results provoked intense anger among the authorities. In a report of the meeting that appeared in one newspaper, for example, Sakharov was labeled an "engineer," and it was asked just what an engineer could know about matters of biology.

In 1966 I attended a discussion on "Science of the Future" held by the State Committee on Science and Technology. A Rand Corporation prediction of the future of the US through the year 2025 had been circulated for internal use in the Soviet scientific community, and Vladimir A. Kirillin, chairman of the committee at the time, decided to conduct a discussion of corresponding

problems and predictions under the conditions of our own society. He gathered a few scientists, including Sakharov, Nikolai G. Basov, Vitaly L. Ginzburg, Yakov B. Zel'dovich, Bruno M. Pontecorvo, Alexander M. Prokhorov and me. Each participant offered his own predictions regarding the development of the particular scientific fields in which he was working. Sakharov was very interested in the possible use of nuclear explosions for scientific and economic purposes, in particular, to produce immensely strong magnetic fields. Later, in the 1980s, he was to suggest that low-yield underground nuclear explosions be used to prevent earthquakes or to trigger them at a set time.

1968: Final suppression of 'Khrushchev thaw'

The next vivid event linked with Sakharov's name came in 1968. This was a difficult year for all of us. It marked the irrevocable end of the "Khrushchev thaw." In March, student uprisings in Poland were sternly suppressed. On 21 August, armed forces of the Warsaw Pact countries marched into Czechoslovakia to put an end to the democratic movement known as the "Prague Spring." That day is remembered by many of us as one of the tragic days of our lives.

That same year Sakharov wrote his famous essay "Reflections on Progress, Peaceful Coexistence and Intellectual Freedom." The treatise was distributed to all the members of the Presidium of the USSR Academy of Sciences. I had an opportunity to read Semenov's personal copy. This essay was a cry of the heart, quite appropriate for the period but coming at absolutely the wrong time in the opinion of the authorities. They fired Sakharov from his job at Yuli B. Khariton's "Installation," a secret atomic research facility. Soon after, Sakharov showed up in Moscow.

Actually, there was a short period in my life during which I *did* see Andrei Dmitrievich fairly frequently. In late 1973, an infarction put me in the academic hospital. Recuperating there at the time were Andrei Dmitrievich; his wife, Elena Georgievna Bonner; and the eminent astrophysicist Iosif Samuilovich Shklovskii. Shklovskii had known Sakharov for a long time, and through him Sakharov and I became better acquainted. Since I was bedridden, they came to visit me, and we had some long conversations. Aleksandr Solzhenitsyn's *Gulag Archipelago* appeared at about that time, and we discussed it.

This account would be quite incomplete without a few kind words about Elena Georgievna. When I first saw her in the hospital with Andrei Dmitrievich, it seemed to me that they complemented each other in a surprisingly harmonious way. When the times were tough, she always supported him, and he her. (When Sakharov and his wife were banished to Gorki in 1980, the corner of 67th Street and 3rd Avenue in New York, by the building housing the Soviet UN mission, was named "Sakharov-Bonner Corner" in protest. Now they will remain there together forever.)

An event that draws a clear picture of Sakharov occurred on 13 February 1974. By that time he had checked out of the hospital, but I was still there. I was sitting with two colleagues in the lobby, reading a plan for a joint paper, when Andrei Dmitrievich appeared. We



Sakharov returns to Moscow on 23 December 1986, after nearly seven years' exile in Gorki.

greeted each other. He said that he had come for his mail, which was still arriving in packets for him at the hospital, several weeks after he had checked out. He said he was happy to see that I was up and around, and then he slipped immediately into what was really on his mind: "You know, an outrageous act has been committed. They have exiled Solzhenitsyn. They have simply thrown him out of the country by force!" Sakharov had come straight to the hospital from the airport; his excited words could be heard by everyone in that overcrowded lobby.

Although I understood and indeed shared Sakharov's feelings, at that particular moment I was somewhat uncomfortable with the idea that his words would drown out the other conversations and would attract everyone's curiosity, which by no means would be benevolent in all cases. I attempted to steer the conversation to another topic, asking him about his health and that of Elena Georgievna. He answered briefly and then lapsed back into the Solzhenitsyn affair; Solzhenitsyn's fate was blocking all other thoughts from Sakharov's mind at that moment. Having blurted out his indignation, Andrei Dmitrievich walked out quickly. My colleagues were curious to know just who this strange man was. Hearing the answer, they forgot about the unread paper and ran out of the hospital to watch Sakharov leave, if only from a distance.

Humanist

I cannot say that Sakharov was the greatest scientist of all time and all places. To say so would be an exaggeration, and Sakharov needs none of that. However, on the basis of an "all-around score"—computed from his personality and his scientific, social and humanitarian activity—Sakharov can legitimately be ranked among the greatest sons of humankind.

We saw Sakharov in three roles: a scientist who created the most destructive weapon ever, a humanist who

invested his soul in the effort to see humanity live without weapons in a democratic and free society, and a remarkable thinker, not only in the realm of the natural sciences but also in the realm of the social sciences. We do not know of another such person—at any rate, I do not intend to waste time searching for another example or even for a reasonable approximation.

Looking at Sakharov in his later years, you would see a weak and stooped man, his physical strength apparently on the decline. The poet Yevgeny Yevtushenko has drawn a surprisingly accurate picture by comparing Sakharov's head with a dandelion. Inside this by no means Herculean body, however, thrived an inflexible strength of spirit. Sakharov's strength of spirit was seen particularly clearly during his exile to Gorki, where he went on several hunger strikes, and where his life was in danger (since there are a fair number of active hatemongers in our society).

His inflexible strength of spirit also emerged in words and deeds that at times looked like mistakes to me. I was present at his many speeches at the First and Second Congresses of People's Deputies of the USSR. It sometimes seemed to me that in deliberately stirring up trouble and drawing fire to himself he was making it difficult to reach a compromise solution that might have been a step forward. However, I and many other deputies were apparently not always given to understanding his internal logic or just where his thoughts were leading, so it is difficult for me now, in retrospect, to judge whether one or another of his steps was tactically correct. Indeed, the matter is unimportant. The only important point now is that Sakharov lived and acted among us. I hope that in doing so he succeeded, to some extent, in changing all of us—the entire world—for the better.

This article was excerpted with permission from the Soviet journal Vestnik AN SSSR and was translated from the Russian by David H. Parsons.