

**Translated and adapted
by Mary Fleming Zirin and Hal Zirin
W. W. Norton & Co., 1991
268 pages**

An informal, humorous autobiography of a leading Soviet astrophysicist (1916-85), this is also a bitter and revealing account of what it felt like to be a scientist in what was the Soviet Union. With daily newspaper accounts of internal weaknesses revealed, with the crumbling of the "Union," it may be difficult to recapture the oppressive atmosphere of his scientific life. Translated by Shklovsky's friends, Mary and Hal Zirin (Hal is professor of astrophysics at Caltech and director of the Big Bear Solar Observatory and his wife is a translator of Russian literature), the book has a long and personal introduction by the pioneering rocket scientist, Herbert Friedman, also a good friend of Shklovsky's. The Zirins have added many footnotes, explanations of historical background, personalities mentioned, and corrections. The title derives from Shklovsky's order of magnitude estimate of Soviet annual vodka consumption, which he found to be a "classified" number; but the distance to the Moon was available. Our amusement at the number may be tempered by the picture of 5×10^9 bottles in orbit between Moscow and Mare Stupefactionis, with drunkenness a plague of galactic proportions.

The title suits the book, a mixture of scientific discovery after personal struggle, of bitter experiences with inept and corrupt leadership, of the good and bad in a society that we only now see through a crumbled facade. It is not a depressing account, since Shklovsky was truly irrepressible. He was good company and a good scientist. For decades he was denied travel permission, but in only a few trips to the West he made warm friends.

Quite seriously, this book is like one I wish I could have written; not only do I lack the courage and time, however, but our country is full of lawyers. Truth is seldom a defense against the expenses of libel suits. I also have had irritating, fascinating bosses and colleagues (mostly competent); I also have served on committees to advise the government, which were mostly voices blown away in unheeding winds. Here, too, there are missed or unrecognized discoveries; the successful are not always worthy; planners and administrators make mistakes. Being a senior scientist in the US has a rich, complex reality. Alas, my autobiography on that topic will not be publishable.

Shklovsky's was also unpublishable in Russia. The Zirins translated a smuggled typewritten copy, but Shklovsky died before his ironic sketches reached even that stage. I miss him as a colleague and as a charming, lively human being, even if his anecdote about me describes me as "thick-set," makes me director of Palomar and places Caltech in Berkeley. He ascribes magic powers to me in arranging a trip around the US, providing money for Novikov and himself (apparently through my nonexistent, high-level government influence). He tells Ed Teller that in the USSR he is given the epithet "cannibal." To my wife he says, "The Moscow Art Theater, it stinks, but today I have seen your Disneyland." An amazing personality destined to be out of place almost anywhere, he might have fitted Caltech.

He writes of many of his contemporaries in Soviet physics. A charming anecdote about Sakharov tells how they met on a train evacuating intellectuals

from Moscow to Siberia in 1941. Shklovsky lent him Heitler's *Quantum Theory of Radiation* overnight. When asked if he had finished it, Sakharov replied, "Yes, why not?"

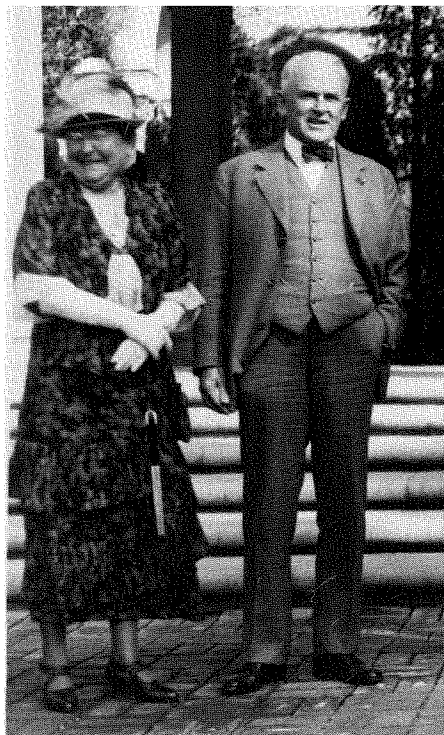
As a scientist, Shklovsky was expert in applying new ideas in physics to unusual situations in astronomy. His single most influential contribution was his 1953 explanation of the continuum radiation of the Crab Nebula (a supernova remnant) as the synchrotron radiation from high-energy electrons (1 to 100 GeV) spiraling in a magnetic field. He extrapolated its radio frequency spectrum to the optical region; he required in the Crab both that such electrons exist and that, since they lose energy rapidly, they must be replenished. (Protons at cosmic-ray energies are poor radiators.) The existence of an electron component at cosmic-ray energies had many important results; presumably they arise from the spinning pulsar in the Crab. From 1936 to 1955 I had vainly tried to explain radio frequency noise as thermal in origin; the revolution started by Shklovsky began the rush of high-energy physics into astrophysics. Magnetized plasmas, hot gases in rapid motion, seem now omnipresent.

He also became a force in the space program. Another novel contribution lent respectability to the search for extraterrestrial life and intelligence. For a symposium he organized in 1961 he wrote an imaginative account of the problem, although he admits weakness in molecular biology. He was the only participant to submit a manuscript on time, which he published in 1962 as a book that "sold out a printing of 50,000 copies in a few hours. . . five editions. . . many foreign languages. . . and in Braille." Its American translation as *Intelligent Life in the Universe*, with extensive additions by Carl Sagan, became a phenomenal success. Shklovsky's mind was fertile, freely roving; lacking the self-critical facility of the less gifted, he also made many mistakes. Herb Friedman's introduction is a warm picture of his personality and scientific contribution. Please read the book.

Jesse L. Greenstein

Lee A. DuBridge Professor of
Astrophysics, Emeritus

Letters



Editor: In your fall edition on page 39 at the top you show a photograph which includes Dr. Millikan with Mrs. Balch on his right. During those years Mrs. Balch was a trustee of Scripps College. I was a junior there and in the spring of 1934 I was involved in a student protest which turned out to be both serious and important in the growth of the college. Mrs. Balch came out to interview us. For two hours she sat opposite me in probably the same dress as in the photograph and certainly the same hat. I feel you have identified her correctly.

Carlotta Welles

Member, The Caltech Associates

Editor: Not being a man of science, I very rarely am capable of enjoying articles in *Engineering & Science*. However the fall issue did contain two articles which I enjoyed reading, one on Shakespeare and the other on Sidney Weinbaum.

The latter article made me even prouder to be associated with Caltech. I think printing the article about Weinbaum and the difficult times of the late forties and early fifties, which I remember so well and need to be reminded of from time to time, in such an objective manner without editorializing about his guilt or innocence of an inconsequential "crime" peculiar to that era, speaks very well about an institution of science.

Arthur Rock

Caltech Board of Trustees

Editor: Your oral history excerpt from Sidney Weinbaum was both sobering and inspiring. Whatever his political affiliations during the Depression, three years in prison was an extraordinary price. It is hard for someone my age to fully understand the climate of that era, but I found the yellowed clippings from our local papers chilling.

Thanks for illuminating a dark chapter of our history. Perhaps with the cold war over at last, we can dismantle the vast security apparatus that has been so costly to our economy, our liberties, and our sense of decency.

Rick Cole

Vice Mayor, City of Pasadena

Editor: Your account of the Sidney Weinbaum trial includes a reference to