Astronomer at Large

Five Billion Vodka Bottles to the Moon. Tales of a Soviet Scientist. IOSIF SHKLOVSKY. Norton, New York, 1991. 268 pp., illus. $19.95. Translated from the Russian by Mary Fleming Zirin and Harold Zirin.

Iosif Shklovsky was a remarkable scientist and human being; this book of memoirs produces a spellbinding portrait not just of him but of the Soviet science establishment and many of its eminent members. Shklovsky was at once a survivor of the mean and ugly Russian existence of World War II, a remarkably creative scientist, a teacher and inspiration to many eminent Soviet astronomers, and a student, critic, and victim of the Soviet system. Above all, he loved all aspects of life, and he retained an almost childlike curiosity and wonder about the people and phenomena in the world about him.

The book begins with an accurate and revealing biography of Shklovsky written by his old friend and colleague Herbert Friedman, the eminent retired leader of the Naval Research Laboratory and pioneer of x-ray astronomy. The main body of the book consists of 24 essays, translated from a crude typescript that was quietly transferred to the United States by a colleague prior to glasnost. The translation by Mary Fleming Zirin and Harold Zirin is excellent and very readable and uses a rational orthography in transliterating Russian words and names.

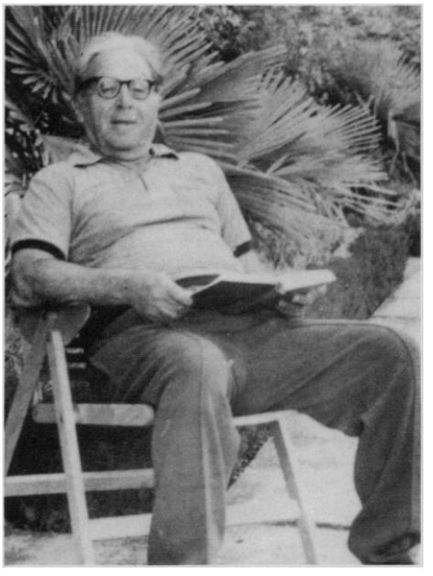
Most of the 24 essays deal with Shklovsky's interactions with Soviet scientists and officials. Some remarkable vignettes emerge. We read, for example, of Shklovsky's dismal train ride, with other young physicists, from Moscow to Ashkhabad in Turkmenia, to escape the Nazi invasion. One young physicist astounded Shklovsky when, to overcome the boredom, he borrowed Shklovsky's only book, Heitler's *Quantum Theory of Radiation*, and read it with ease from cover to cover; Shklovsky himself had gotten hung up on the first page. The student was Andrei Sakharov. Indeed, Sakharov was a friend of Shklovsky's throughout their careers, and the many references to Sakharov in this book probably tell more about him than much longer biographies.

Three leitmotivs are present in this book, although Shklovsky did not set out to emphasize these matters. One is the wastefulness in Soviet science caused by the lack of adequate peer review. Projects are often started here and there with inadequate funds or planning just because an institute director thinks it is a good idea. The consequence is waste, delay, and an inferior final product. Results and theories are published without adequate checking, leading to later embarrassment. Shklovsky tells a hilarious story of the time he was sent to the "Leningrad Institute of Physics and Technology" to advise them on their work. Upon arriving, he found this institute to be a major enterprise whose main activity, a very secret one, was based on the ridiculous idea of its director that meteors were made of anti-matter and some means might be found to make superweapons out of them. It took only a few minutes for Shklovsky to prove that meteors were ordinary matter, and the whole *raison d'être* of the institute was false. He wasn't very popular.

Second, Shklovsky emphasizes that success at anything in the Soviet Union requires one to see through the widespread pretense that things are better than they are, from food to buildings to people. So much is "camp," claiming a high quality that is not justified by reality. Shklovsky loves to tear down phony facades. Most intriguing are Shklovsky's no-holds-barred assessments of the qualities of a large number of well-known scientists; in my opinion these assessments are accurate and unprejudiced. Shklovsky has his heroes and villains, and they are named here. It is also interesting to identify those he downgrades by simply not mentioning them; unfortunately, only experienced radioastronomers will be aware of the missing names. It is of interest that a Russian version of this book has now been published. It is shorter than the English version, and it has been sanitized. Criticisms of living Soviet scientists have been expurgated; the ghost of the old Soviet system has not yet been totally exorcised.

Shklovsky's perceptions of American scientists are fresh and mostly accurate, although here he is traveling in terra less cognita, and so occasionally he stumbles. The prime example is his conclusion that the English translation of his book *Intelligent Life in the Universe*, greatly expanded to good effect by Carl Sagan, was the "springboard" for Sagan's dynamic career. In fact, this book, which listed Sagan as a co-author, was obviously but one small item among many scientific and public-education contributions that brought Sagan early prominence. Shklovsky's history of this book includes a rare departure from candor. He clearly implies that he received no royalties from the English edition because the Soviet Union had not signed the international copyright agreement, and so the publishers owed him nothing. In fact, Sagan insisted that the publisher pay Shklovsky the equivalent of royalties. The publisher acquiesced, and Shklovsky was presented with a handsome check. He never cashed it, fearing trouble with the KGB. He evidently was afraid to mention this in these pre-glasnost memoirs.

The third leitmotiv, a matter that simultaneously angered and bemused Shklovsky, is anti-Semitism. Throughout the book he describes a steady drumbeat of slights and digs, unfair treatment or opportunity, even a 1951 loss of job, all openly a result of Shklovsky's Jewish origins. Election to the Academy of Sciences or directorships? Those were reserved for the apparatchiks and those of the correct ethnic group. It



"Iosif Shklovsky relaxes at 'Gorny,' a resort for scientists, VIPs of atomic industry, writers, and scholars. Located in the mountains of the Crimea overlooking the Black Sea, Gorny is the mountain sanitarium of the Ministry of Medium Machine Industry, which was the cover name of the USSR atomic program, 1983." [From the dust jacket of *Five Billion Vodka Bottles to the Moon*; photograph courtesy Alexandra Dmitrievna Ulyanitskaya]

rankled Shklovsky that his internal passport listed him as "Jew," not "Russian," especially since his education in the Soviet system had made him feel very much a full-fledged citizen of the country and he had served it well. He observes how many others suffered, sometimes much more seriously, from this pervasive anti-Semitism. Despite the extensive damage done to him by anti-Semitism, it is interesting that his condemnation of it, at least here, is limited—he seems to look upon anti-Semitism as one example among several of the weaknesses of some of the people in powerful positions in the Soviet Union.

Because of his contempt for pretense, Shklovsky loved to visit the West, where to him things were much closer to what they claimed to be. I remember a jolly walk with him on the first day of a meeting in Brighton, England. As though he had lived there all his life, he somehow knew how to lead us directly to his prime goal: a shoe store. He stood in front of the window and exalted at the shoes he saw; he knew they would be of a quality commensurate with their appearance, that he could buy them, and to him all was right with the world. In the book he describes a time when, by mistake, he was given a visa that allowed him to stay 12 days in Paris after a meeting. He had almost no money, but he was not about to be denied those days in Paris; here you can find a charming lesson on how to live in Paris on $1.40 a day and love every minute of it.

Nevertheless, Shklovsky's heart was deep in Russia. Although he knew he could have any number of glorious jobs in the West and could escape all the ill treatment he received in his own country, as far as we know he never even considered any of the many opportunities he had to leave Russia. In fact, if the subject was raised, he would not even talk about it. This was to the great benefit of the Soviet Union. He was an amazingly creative scientist. He started many important projects. He trained and motivated a large number of leading Soviet astronomers; indeed he worked hard to bring out the best in people. Recently we held a joint U.S.A.–U.S.S.R. scientific symposium that was attended by an impressive Soviet delegation. It was remarkable how many of those scientists had been students or colleagues of Shklovsky's. This book captures beautifully the essence of this unique and humane person, and how he came to be a person who could so influence his own and future eras.

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Homo habilis in Detail

Olduvai Gorge. Vol. 4, The Skulls, Endocasts and Teeth of *Homo habilis*. P. V. TOBIAS. Cambridge University Press, New York, 1991. Two volumes, boxed. xxxvi, 921 pp., illus., + plates. $175.

Summer 1959 witnessed the discovery of what would prove to be two new, early species of extinct Hominidae from the oldest sediments exposed in the deepest reaches of Olduvai Gorge, northern Tanzania. The first, represented by a small jaw fragment with wisdom tooth (Olduvai Hominid 4), was utterly overshadowed by Mary Leakey's finding, shortly thereafter, of the marvelously preserved cranium (OH 5) that became the type of *Australopithecus boisei* (L. S. B. Leakey, 1959). However, beginning in late 1960 and repeatedly thereafter, further discoveries, largely from *in situ* excavations, eventuated in the recovery of additional hominid skull parts, some comparable to the initial fragment of 1959, sufficient to warrant recognition of a new species attributed to genus *Homo*, *H. habilis* (L. S. B. Leakey, P. V. Tobias, and J. R. Napier, 1964). In late 1968 the first largely complete, though much crushed, cranium with dentition (OH 24) was recovered, and subsequently (1971) it also was attributed to the species. In all as