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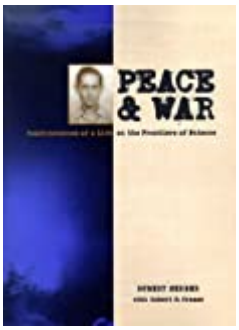

Robert Serber. *Peace & War: Reminiscences of a Life on the Frontiers of Science.* New York: Columbia University Press, 1998. xxiii + 241 pp. $29.95 (cloth), ISBN 978-0-231-10546-0.

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American physicist Robert Serber has recorded his memoirs in *Peace & War: Reminiscences of a Life on the Frontiers of Science*. Dr. Serber (1909-1997) was one of the important physicists of mid-twentieth century and was a group leader at the Los Alamos laboratory during the Manhattan Project. He later led the initial evaluation team to the atomic bombing sites at Hiroshima and Nagasaki. After the war, he returned to academic pursuits, while retaining influence in the technical debates regarding feasibility of thermonuclear weapons. He served as president of the American Physical Society from 1970 to 1971 and as chairman of the physics department at Columbia University from 1975 to 1977.

This book is based on Dr. Serber's participation in Brookhaven National Laboratory's George B. Pegram Lecture Series in 1994, and it is edited by Robert P. Crease, an historian at Brookhaven and an associate professor at SUNY-Stony Brook. The book reflects its origins; it consists of a series of reminiscences of Dr. Serber's life, but rarely explores any single topic in depth.

Dr. Serber captures some of the excitement of the magical fifteen years of physics prior to the Second World War. During this period, Heisenberg established his matrix mechanics formulation of quantum mechanics, Chadwick discovered the neutron, and Lawrence demonstrated the feasibility of the cyclotron. Serber took his Ph.D. at Wisconsin in 1934 and then did his post-doctoral study under J. Robert Oppenheimer at Berkeley. They collaborated on important advances in cosmic ray and nuclear physics. Serber frequently lapses into the jargon of nuclear physics, but the lay reader can skim over these sections and gain the author's enthusiasm for the subject, even if he is unable to appreciate the intricacies of the physics.

After his post-doctoral work, Serber received an appointment at the Physics Department of The University of Illinois-Urbana and maintained a cross-country collaboration with Oppenheimer. In April, 1942, Oppenheimer summoned him back to Berkeley to work on the physics of the atomic bomb. Serber presented his work on the feasibility of the bomb to a July, 1942 conference organized by Oppenheimer and attended by Hans Bethe, Edward Teller, Felix Bloch, and other theoretical physicists. It was at this conference that Teller proposed the concept of a thermonuclear weapon which was dubbed the "Super." One wishes that Serber would have described the reception which Teller's concept met in greater detail.

Serber went on to Los Alamos where he gave a series of orientation lectures which became the famous *Los Alamos Primer* and was a group leader under Bethe, with responsibility for the design of the uranium device (Little Boy), but he does not discuss this work in his book.

Serber's wife, Charlotte, served as the librarian for Los Alamos and was a group leader herself.

Serber attended the Trinity test of the first plutonium device, where he witnessed the explosion without eye protection and was temporarily blinded. He went to the Pacific island of Tinian, out of which the Hiroshima and Nagasaki raids were based. He was assigned to film the Nagasaki explosion using a high-speed camera being carried in a photo-reconnaissance B-29 accompanying "Bock's Car"; however, he reported to the plane without his parachute, and the pilot refused to let him on. Again, Serber's terseness is frustrating, and one can find a more complete description of the incident in Major Charles Sweeney's *War's End: An Eyewitness Account of America's Last Atomic Mission* (Sweeney piloted Bock's plane, which dropped the bomb on Nagasaki).

Serber headed the team of physicists which visited Hiroshima and Nagasaki and studied the damage to these two cities. The chapter describing his work in Japan is the most interesting of the book, and, like the chapter on activities at Tinian, it features lengthy excerpts from letters to his wife. It is here that Serber indulges in a rare display of emotion when he writes to Charlotte, "[a]fter a few trainloads of PW's [prisoners of war] any latent sympathy for the Japanese is pretty well dispelled." Serber does provide a good description of Japan immediately after the war, and the reader shares in his frustration at the difficulties in finding transportation and accommodations.

After the war, Serber returned to Berkeley where he headed up the theoretical division of Lawrence's Radiation Laboratory. It was during this period that American physics enjoyed pre-eminence due to the high-energy "atom smashers" being developed and built at the Rad Lab and other places. Serber describes his key role in the development of high-energy theoretical nuclear physics and in the design of various cyclotrons, synchrotons, and other particle accelerators. Again, he assumes that the reader is conversant in these fields.

Serber's wife was the daughter of a Philadelphia doctor named Morris V. Loef, whose house served as a salon and was frequented by personages such as playwright Clifford Odets and journalist I. F. Stone (interestingly, the great physicist Wolfgang Pauli also once visited the Loef household). Loef's causes were left-wing, and Serber and his wife had supported the Spanish Republicans during that country's civil war and had minor involvement in labor causes at Berkeley while there as a post-doc. In July, 1948, Serber was the subject of security hearing at Berkeley. The evidence against him was, at best, insubstantial, and he passed the hearing "with glowing praise" according to Oppenheimer. Nonetheless, he "found the experience humiliating and frightening" and understandably "resented having been put through it." Serber covers this incident in as much detail as any, and the reader is grateful for his attention to it.

The General Advisory Committee, headed by Oppenheimer, of the Atomic Energy Commission held an important meeting in Washington, D.C. at the end of October, 1949, in response to the first explosion of a Soviet plutonium device on August 29, 1949. Lawrence proposed to take charge of the construction of a set of heavy-water reactors for the production of plutonium and tritium, and Serber served as his emissary to this meeting. At this meeting, James Conant argued strongly against the development of the "Super," even associating the word "genocide" with it. Serber was surprised that Conant's views would be espoused, writing that "[a]t Berkeley they would have been unthinkable."

In 1950, the Regents of the University of California required that all faculty and staff take a loyalty oath. Serber personally did not take the matter seriously and did take the oath, but several of his friends and colleagues refused to do so and were dismissed. As the political atmosphere became increasingly stifling and as the rift between Lawrence and Oppenheimer developed, his position at Berkeley became less tenable, and he moved to Columbia University in 1951.

Serber describes his work at Columbia and the nearby Brookhaven National Laboratory, but more interesting is his depiction of his involvement with the American Physical Society, where he served a one-year term as president during the Vietnam War. Factions within the APS wanted to take a position regarding the war and other social issues, but Serber insisted that the APS stick to its charter of furthering the study and understanding of physics. On a more personal note, he also describes his life with Oppenheimer's widow Kitty following the deaths of their respective spouses in 1967, and how, following Kitty's death, he remarried and sired a son.

As Dr. Crease points out in his foreword, the reader is frustrated by Serber's reticence in discussing some of the issues raised by his work. The debate regarding the use of the atom bomb against Japan is barely mentioned, and the questions regarding the development of thermonuclear weapons, with which Serber played an important role, are inadequately discussed. While Serber does offer some illuminating vignettes regarding many of the giants

of theoretical physics with whom he worked (Columbia's physics faculty won nine Nobel Prizes), one wishes that Oppenheimer, Teller, and Lawrence would have been discussed in greater detail. For an understanding of the development of nuclear weapons, Richard Rhodes's *The Making of the Atomic Bomb* and *Dark Sun: The Making of the Hydrogen Bomb* give a good overview. Serber's memoir adds some coloring, but his unwillingness to put forth his observations regarding the issues and implications of his work remains disappointing. Finally, although the topics that occupied Serber's attention during different periods of his career may be traced through a chronologically listing of his scientific papers provided as an appendix, the book unfortunately lacks an index.

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