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Dark Sun: The Making of the Hydrogen Bomb

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Rhodes, Richard. *Dark Sun: The Making of the Hydrogen Bomb.* Simon & Schuster, 1995. 731pp. $32.50

If the goal were purely commercial, this volume might have been titled, "The Making of the Atomic Bomb, Part II, the Sequel." Richard Rhodes completes the chronicle of "the Bomb" with *Dark Sun*. Rhodes's earlier, Pulitzer Prize–winning book presented an epic description of the science, politics, and history culminating in the dropping of "Little Boy" and "Fat Man" on Hiroshima and Nagasaki, respectively. These events only marked the beginning of our ability to destroy civilization. The development of the greater thermonuclear power is documented in this book, with the same thoroughness and gusto of Rhodes's earlier volume.

The race for the atomic bomb was driven by fear of a German bomb. The race for the hydrogen bomb was dominated by the Cold War, which began even as the United States and the Soviet Union were still allies. *Dark Sun* describes how espionage kept the Soviet political leadership abreast of American atomic bomb efforts and enabled Lavrenti Beria, head of the Soviet secret police, successfully to direct the Soviet fission bomb project even though he neither understood nor trusted his own scientists. This knowledge also gave Igor Kurchatov (the Russian scientist who played a role comparable to that of Oppenheimer in the West) the confidence to build an atomic bomb in far less time than generally thought possible. Soviet scientists were certainly capable of creating the bomb without the information passed on by Klaus Fuchs, but without it their efforts would probably have been delayed considerably because of political interference.

Rhodes describes how Edward Teller delayed the development of the hydrogen bomb by his hyperbole and his insistence on pursuing a design that would not have worked. The creation of the hydrogen bomb required the efforts of many. If fatherhood were to be bestowed, it would be Stanislaw Ulam who should claim paternity. The Polish emigré mathematician proved through laborious calculations that Teller's "Super" would not work. Shortly thereafter, he invented the staged, radiation-imploded hydrogen bomb. After reading this book, my impression is that Edward Teller acted externally as a cheerleader for a megaton-yield device but internally obstructed the development of a working thermonuclear weapon.

The sad episode of the unfair treatment of Oppenheimer is placed in the context of the interplay of personalities and politics in the 1950s. Lewis Strauss, chairman of the Atomic Energy Commission (AEC), who lifted Oppenheimer's security clearance, is described by another AEC commissioner: "If you disagree with Lewis about anything, he assumes you're just a fool at first. But if you go on disagreeing with him, he concludes you must be a traitor." As seen through the eyes of the intellectually insecure and thin-skinned millionaire, the urbane, well educated Oppenheimer was bound to fall into the second category.

The strength of this book is that it can be read at many levels. For the scientist, such technical intricacies are provided as how neglecting the role of lithium 7 caused the yield of the 1954

Castle Bravo test to be three times that predicted. (This miscalculation had deadly consequences for the Japanese fishing boat *Fukuryu Maru*, the "Lucky Dragon," which was outside the declared exclusion zone.) For the Sovietologist, Rhodes's account means in particular that the result of espionage by agents like the Rosenbergs was that Beria would not hinder the Soviet development effort. The physicist notes that the bulk of the yield of a thermonuclear weapon comes from the fission of the normal uranium isotope casing. The political historian appreciates the importance of the climate of McCarthyism, which led to Oppenheimer's loss of his security clearance and the ostracism of Teller from the mainstream physics community. The military historian realizes how close the United States came to a thermonuclear war during the Cuban missile crisis, and how Strategic Air Command's Curtis Lemay tried to gain control of U.S. nuclear weapons, independent of the White House. There is such rich detail here that the scientist can see the politics and the political scientist can see the science.

However, *Dark Sun* is not light reading. The book takes commitment but is well worth the time. It is the comprehensive story of the development of the hydrogen bomb, detailing personalities in the scientific, military, and political communities on both sides of the Iron Curtain. The end of the Cold War has brought disclosures that help to make this history rich and complete. Rhodes illustrates how each discipline is connected to the others; no decision can be made in isolation.

Also recommended is *Dark Sun*, on tape, for an abridged version read by the author.

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Murray, Williamson. *Air War in the Persian Gulf.* Baltimore, Md.: Nautical and Aviation Pub. Co. of America, 1995. 338pp. $34.95

This book is of special value to the national security community because it gives a detailed account of airpower in the Gulf war. The maps are exceptional, the tables and annex on disposition of aircraft invaluable. While one cannot accept some judgments—the KARI air defense system was not taken down in its entirety in the first six hours of the war; Iraqi pilots did come close to damaging Saudi oil fields; and there were problems with targeting pods, laser guided munitions, and rules of engagement that had greater significance than did those discussed here—the bulk of the book is instructive and useful. However, I would have liked it to have been advertised for what it is—a reprint of a three-year-old government study (Part I, "Operations," vol. II of the *Gulf War Airpower Survey* [GWAPS], Washington: U.S. Government Printing Office, 1993.) (N.B.—The shortfalls of this volume noted above are dealt with elsewhere in the GWAPS.)

Thus, this book is not a new scholarly work on air war in the Persian Gulf. Save for a few pages of new introduction, the elimination of some pictures, occasional additions where classified