

REVIEWS

Brotherhood of the Bomb

by Gregg Herken

Henry Holt and Company, 2002, \$30, 448 pages, ISBN 0-8050-6588-1

This book traces the lives of Oppenheimer, Lawrence, and Teller. Now, some 40 or more years after the events described, the files are open, memoirs exist, and the historian/author was able to conduct interviews with many of those who lived through the times. The result is a comprehensive book that both reads exceptionally well and yet has 100 pages of small-print notes.

The book focuses on the three principles, but of course hundreds of others cross their lives and many of these are dealt with at great length. The emphasis is upon the personalities and the politics, but there are certainly plenty of technical details. For example there is much discussion of the early history of the cyclotron and of the laboratory that Lawrence developed, but the discussion of the operation of a cyclotron is limited to saying that particles are bent in a circle and that radio frequency fields (rf) are employed. Just how rf is employed is not described, but the importance of the development of radio tubes, and powerful rf generators, is noted. Nevertheless, the primary emphasis is on the interaction of Lawrence with the University of California and with sources of private funding.

Similarly, Herken hardly mentions how an atomic weapon operates, but he devotes a good deal of discussion to the people involved, their personalities, the political machinations both before and during the project, the geographic location of various elements going into the bomb, etc. Despite the lack of technical detail, however, one learns technical things. For example, although the main emphasis is on the people and the locations and the rivalries and efforts, and ultimate performance associated with the various processes used during WW II to separate uranium (diffusion, centrifuge and electromagnetic), one learns that electromagnetic separation, or calutrons, were in fact the devices that separated the material for the Hiroshima bomb. This is not commonly realized, for after the Hiroshima bomb the electromagnetic method was not used, as the other two methods proved to be cheaper and simpler.

By proposing electromagnetic separation, and then making it work, Lawrence played a key role in developing the atomic bomb. He was the only scientist, of the few that spoke directly to Secretary of State James Byrnes, who advocated a demonstration to the Japanese of the power of the bomb, rather than its actual use.

A considerable part of the book is devoted to Teller's early history and to his later important role with the development of the hydrogen bomb. It is interesting to remember how Teller was supported in these efforts by Lawrence who built the Materials Testing Accelerator (MTA), a name chosen to confuse Soviet spies, to produce the tritium Teller needed and couldn't get (it was being used to build the stockpile). The MTA never produced anything, but Lawrence and Teller were successful in forming a second weapons laboratory in Livermore.

The 1950s McCarthy era and the related California oath are described in much detail. The trial of Oppenheimer is carefully delineated, with particular attention to the personalities, motives and actions. It is important to attentively read the careful history of Oppenheimer's

association with communists--his brother was a member of the party--so as to better understand the events leading to his persecution.

The significant role of Lawrence in the arms race surprised me. Not only was he active in pushing the development of Teller's hydrogen bomb and founding Livermore Laboratory, which I knew about, but he was active on diverse committees and was, after Oppenheimer's removal, perhaps the senior active advisor to the government and played a crucial role in the cold war arms race. On the other hand he became active in arms control only in his last years. In fact this activity was instrumental in his early death. Teller, as we know, played a very large role in national defense after Oppenheimer and Lawrence left the scene. It is most interesting to repeatedly see his exaggerated concern about the Soviets and his excessive technological optimism. Rarely did technical reality justify his remarks, but this didn't seem to either phase him or disturb his contacts in the Department of Defense who continued to rely on his judgement.

I highly recommend this impressive book. The open files, the many interviews, the careful history, and the deep scholarship of Gregg Herkin have disclosed many new, and important, things. In addition, the book is an easy read. It is an interesting and important compliment to those many books that are more technically oriented. It was fascinating to me--and I had thought I knew everything there was to know about that period.

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A Convenient Spy: Wen Ho Lee and the Politics of Nuclear Espionage

by Dan Stober and Ian Hoffman

Simon & Schuster, 2001, 384 pages, \$18.20, ISBN 0-7432-2378-0

I highly recommend reading this book, at least if you can imagine popping through the latest techno-thriller; this book is shorter and much more breathtaking. I myself re-read it several times, not in the least because the overlapping jurisdictions of different counterintelligence, prosecutorial and judicial offices, which dealt with the matter, is hard to remember and even harder to rationalize.

The authors, Dan Stober from the San Jose Mercury and Ian Hoffman from the Albuquerque Journal did an impressive job conducting hundreds of interviews with people from all parties to the conflict. As for the book's details of nuclear weapons design, I cannot vouch for their accuracy because I never possessed the necessary clearance and know even less than they do, but at least (and contrary to most techno-thrillers), the technical details are correct from the standpoint of college-level physics.

For the readers who do not remember the case, I recapitulate a few details. American intelligence in the late 1980s became aware, allegedly through intentional leaks by the Chinese, that the People's Republic of China possessed critical details of the design of W88 warhead—the most modern nuclear weapon in the U.S. nuclear arsenal—with the unspoken assumption that the PRC would use this knowledge for their own nuclear program. The subsequent U.S. investigation singled out Los Alamos as the warhead's design center. In the mid-90s, the

investigation converged on the Los Alamos physicist of Taiwanese origin, Wen Ho Lee. During subsequent hearings and trials accompanied by media hoopla of national proportions, he pleaded guilty to one count of mishandling classified information. His guilt in the transfer of the design specifications of W88 was never established.

Wen Ho Lee was not a random target of spy insinuations. The authors detail how he and his wife had been investigated before for their contacts with the Chinese, which the authorities found improper. The FBI considered the allegations unlikely and dismissed them. His security clearance was not revoked at the time.

The authors eschew the conventional lore of the Wen Ho Lee story. They could have had an easy time displaying Notra Trulock, then the intelligence chief of the Department of Energy, as a villain and Bob Vrooman, former head of one of labs' security offices who opposed the spy revelations most consistently, as a hero. But the story is not one-dimensional, and the authors offer many conflicting theories of what happened and why. They list many arguments and counter-arguments in support of several story lines and do not provide a final answer. If only our political scientists would follow suit!

I want to pinpoint two subjects, which were at the core of the Wen Ho Lee controversy. Stober and Hoffman describe in excruciating detail the self-styled involvement of intelligence operatives, such as Trulock, in the matters of law enforcement, for which different standards of probability, proof and veracity apply. It is important to remember what happened at that time, when these days the government mindlessly breaks the barriers between intelligence gathering and law enforcement.

The question of whether Wen Ho Lee was a hapless victim of institutionalized racism and national security paranoia, a misguided attention-seeker, or a willing or unwilling instrument in the hands of Chinese intelligence services (they find the latter theory unlikely), remains further from a definitive answer when you close the book than when you open it. To keep the suspense, I will not tell you more about the book's conclusions.

However, Notra Trulock and a band of his loyalists could have only limited impact. As the authors correctly point out, almost all of their actions could be justified by wrong but perfectly understandable, if not legitimate, reasons. Yet the number of prosecutors and the lab officials who were willing to perjure themselves before the Federal bench misstating what exactly was classified and the precise value of the information Lee possessed, is scary. They also had their counterweights on the other side, most prominently Sig Hecker; director of the Los Alamos National Lab at the time the alleged espionage took place, and Bob Vrooman. The dramatic conversion of Republican Judge James A. Parker in the course of the investigation is pure Shakespeare.

There are several instances of black humor. For example, Wen Ho Lee's bail, conditions of which were supposed to be more stringent than are applied against the mob bosses who can be suspect in direct authorization of murders, was opposed on the grounds that he might be taken from his premises by an airborne commando force. The apparition of Chinese military helicopters in the New Mexico mountains, several hundred miles from any sea or border, may seem a little far-fetched, unless you are an avid reader of militias' lore--or a Department of Justice prosecutor.

This story would not have achieved national prominence if it were not for quite a few politicians who orchestrated leaks and went to the media with innuendos and outright lies about

the affair. These included Secretary Richardson who according to the book authorized leaks to the *New York Times*; Congressman Schiff from Albuquerque who tried to elevate his own stature within the Republican party by describing the Clinton Administration as “soft on China”; Congressman Cox who penned the infamous Cox Report which was implicitly based on the patently racist idea that if the Chinese achieved breakthroughs in weapons technology they must have used foreign espionage, and Senator Lieberman who provided credence to these bizarre notions by peddling the Cox Report to the mass media. As you may observe, the rush to exploit the unproven spy allegations enjoyed bipartisan support.

These and many more went to the networks in droves to portray the entire Chinese-American community, mainland and Taiwanese alike, as virtual pawns in the hands of the Government of the People’s Republic. Cox is quoted to have suggested that every(!) Chinese-owned business must be considered a front for the nefarious activities by the PRC, unless proven otherwise. I leave it to the reader to preview the implications of this unscrupulous exploitation of national security matters for politicking in the post 9/11 climate.

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Something New Under the Sun: An Environmental History of the 20th Century World,

by J.R. McNeill

New York, W. W. Norton & Company, 2001

This is an excellent reference book on worldwide and some local environmental trends. The structure is elegant and clever and it presents several innovative analyses. For example, in Part I "Music of the Spheres," McNeill divides his discussion of various environmental trends into chapters on the lithosphere, the pedosphere (Earth's crust) , the atmosphere, the hydrosphere, and the biosphere.

The book is not an easy read. A tedious tone is set in the preface where, after conceding that environmental change is usually good for some and bad for others, McNeill confesses that sometimes he must "abandon all effort at Olympian detachment and label it degradation, despoilation, destruction" and he does so over and over and over in increasingly outraged tones. The density of detail and lack of consistent storyline in Part I (pages 19-267) probably discourages many readers from making it to Part II which has some of the more intriguing analysis. The level of detail also is sporadic. For example, after going on for two pages about Tampico, Mexico, including a listing of the number of liquor stores and bakeries, McNeill devotes only one sentence to the potential for information technology to change energy use.

That said, I was happy to have made it to his critique of economics and ecology on page 335. Of economic theory, he says "by 1960 [it] had crystallized as a bloodless abstraction in which nature figures, if at all, as a storehouse of resources waiting to be used. No reputable sect of economists could account for depreciating natural assets." Of ecologists he says " [they] pretended that humankind did not exist, they sought pristine patches in which to monitor energy flows and population dynamics. Consequently they had no political, economic, or ecological impact." While some economists are now seriously studying resource depletion, and some ecologists now study urban environments, this dichotomy persists to this day and undermines the foundations for sensible economic/environmental policy.

Finally, the book is crammed with intriguing facts. Some of my favorites: Bad News: in the 20th Century, the human population quadrupled and primary power consumption increased 16-fold. Good News: in the 20th Century, industrial output increased by a factor of 40 and since the latter half of the 20th century, energy intensity has declined. Cool Factoid: human beings...are about 18 percent efficient (at converting food-chemical energy, into mechanical energy). By comparison, horses are only 10 % efficient.

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