



Book Review

By Mark L. Maiello, PhD

Book Review Editor

Building the H Bomb A Personal History

Kenneth W. Ford

Softcover, 222 pages

ISBN 978-9814618793

World Scientific Publishing Co.,

Singapore, 2015

Personal memoirs can be interesting for their personal point of view especially when the events discussed are at the nexus of some world-changing event. In the right hands, it can be a very visceral experience with unique claims to the story based on eye-witness observations, personal conversation, friendship, and perhaps even more intimate relationships with the players who changed history. Successful telling these kinds of stories depends on much — not the least of which is one's role or station at the moments defining the story. And of course, one must be able to nimbly relate these accounts interweaving an on-scene perspective into the overall historical account. In *Building the H Bomb*, we fall somewhere between accomplishment and failure.

This memoir is an honest accounting of Dr. Kenneth Ford's experiences helping to build some of the world's first thermonuclear weapons, but it's a bit bereft of excitement. The approach throughout is very light-hearted, no doubt a reflection of the author's personality. As are many memoirs, the story is speckled with side trips concerning mentors, family, friends, and in this case, some of the big names in weapons development:

Fermi, Teller, and Oppenheimer. But, these little vacations from both the grind and the excitement of weapons development don't necessarily reveal earth-shattering facts about a physicist's life during the late 1940s and '50s or the major players he orbited around. There isn't a new definitive revelation of Edward Teller's heavy hand in H-bomb development (though the author speculates from a firm basis about who is to be credited with the H-bomb's implosion design). The author verifies Fermi's kindly and positive disposition. Oppenheimer, perhaps too far up the chain of command for the author to have had much contact, is commented upon from afar. Others lower in the chain, part of Ford's working group and less publicly known are given quite properly, more ink. But they are less interesting. Ordinary life outside the office (and outside the 1950s computer room) — superficially at least — is given its due. But, is that enough for a reader seeking insight about life as a theoretical physicist on one the biggest game-changing projects in human history?

Ford projects much humility and honesty. He lets you know from what vantage his perspective lies. He was a team member at this time, not a team leader. He was stationed at Los Alamos for part of this story — a place he loves — but was also assigned through the tenacity and influence of his supervisor to the relative comforts of Princeton, New Jersey, USA. He sat in on many high-level meetings that included some of the

major H-bomb luminaries, but was also excluded from some too. He will honestly state that in some instances, he does not recall why he was allowed to remain present or even what he was doing at some of these encounters. As the guy who did not mind working at night, he was often assigned computing time when most of his contemporaries were asleep. He was not the guy who made decisions but the one who helped those that did. Perhaps he is best described as the fly on the wall, though the wall was not always in proximity to where all the action was.

To compliment this romp through a few of the nuclear playgrounds of the mid-twentieth century is Ford's internal scuffle with loyalty oaths, and, eventually, with his own ethics as a result of being involved with the H-bomb. He reveals that he was initially not a politically conscience man. After the first dedicated H-bomb test, the "Mike" shot of 1952, his feelings vacillated between the euphoria of success and the dread associated with the bomb's power, but he was not ready to act on the latter. Scientists had been conflicted about working on the bomb since Hiroshima and Nagasaki. Many, for example, quit their jobs at the uranium separation operations at Oak Ridge once the secrecy ended and they found out what had been created there. Admittedly, descriptions of the human suffering as a result of the atomic bombings was suppressed in the U.S. but, in the small world of physics, the conscientious objection to the bomb



wouldn't have been news to Ford had he been paying it much attention. Instead, his revelations came along slowly, buoyed by the anti-war sentiments of the Vietnam era that eventually pushed him away from weapon's development entirely. But as a tepid contributor to the anti-war movement, his internal rebellion comes across as equally lukewarm narrative. He found his way but in a private, rather quiet, methodical manner (to each his own). Older readers may sympathize with the reality of holding a job, growing into it and then being profoundly changed by the circumstances of one's times. Younger readers should take note that such evolutions do occur. Work thought at first to be interesting and exciting may, through the vicissitudes of national or world events or even very local ones, can become a burden — sometimes of conscience.

Ironically, this straightforward, well-meaning memoir has its share of controversy. The U.S. Department of Energy contends that Ford's book contains secret material. For all the consternation that caused the author, there is little that a lay reader — and that includes scientists from other professions — will find clandestine. The purported secret material is not obvious (Dr. Ford assures us that he was careful not to print anything that could not be found elsewhere), and there is little payoff here for those seeking a thrill associated with this controversy.

Will one be bored? Simply put: No. There is a good story here about a young aspiring Princeton PhD who accepted an offer in 1950 to assist with weapons development in Los Alamos. These honest musings and recollections of a dedicated man devoted to his science provide enough substance to keep one turning

the page. The reader will immediately perceive the framework of the memoir: a devoted, talented scientist seeking to hone his craft with the ultimate intent to make his way into the larger world of research becomes part of one the most controversial and unprecedented feats of physics ever imagined — (initially one with dim prospects of success until the Teller-Ulam breakthrough of radiation implosion). Ford both worked to live and lived to work. Along the way he met some notables, traveled parts of the nation he later fell in love with, and found that despite the satisfaction he obtained from his contributions to the hydrogen bomb development work, his nation's conduct in Vietnam — not notably at Hiroshima or Nagasaki — drove him to reconsider his relationship to his government.

These are the recollections of a talented physicist who was fortunate to have experienced the heady atmosphere of those days when nuclear physics was nascent. He led a life that some might consider chancy — where he worked and what he worked on was not a traditional career path (it was however, a life changing experience). But it's a quiet memoir. The language is simple, straightforward; the sentences short and to the point. There is little embellishment here. When Ford talks about working overnights at an IBM office in New York City, and of his fondness for a neighborhood deli that sustained him, that is all the detail you get. There was apparently no dramatic self-revelation, no epiphany, not even a funny anecdote associated with the lateness of the hour and the endless computer runs done in near solitude. Frequently, the author will journey down other arcane paths with similar lack of entertaining payoff. In particular, he men-

tions the several vehicles he owned, the trips he took with them — one or two admittedly with memorable but not out-of-the-ordinary consequences — and what eventually became of these machines: most found endings that you would expect (sold). Ford applied for and obtained the P.O. box number for what eventually became the Princeton Plasma Physics Laboratory (a direct descendant of the H-bomb development project) — a box number that is apparently still current. These tangents provide but mild diversions. However, the author's daily in-the-trenches efforts and his modest off-work activities as a weapons physicist do not detract from the back-story — the historic game-changing moment he had the privilege to be part of.

The banal is balanced a bit by the personal side of the story. Among the other notables already mentioned, Ford also encountered Von Neumann, the great mathematician and computer architect. He even orbited in the vicinity of the Nobel-prize winning Cornell University physicist Hans Bethe who postulated stellar fusion cycles. But his writing is enlivened, quite naturally, when Ford delves into his relationship with lesser known personalities such as his mentor John Wheeler who so influenced the young physicist. Friend and colleague John Toll is treated equally well. Others also are revered: Princeton assistant professor David Bohm, a roommate and colleague of the author, is given several pages because he ran afoul of the "red scare" promulgated by the House Un-American Activities Committee of the 1950s. The mention of these colleagues, physicists of Project Matterhorn (the hydrogen bomb development effort), do help to invigorate Ford's effort.

The book is well-designed and includes several useful illustrations and many black-and-white (some striking) archival photographs of the work places, physicists, and events that remain near and dear to the author. The sections of the book are cleverly divided by a classy graphic illustrating the deuterium-tritium fusion reaction and its products. The

writing moves along at a reasonably fast pace and can be engaging if not sophisticated. You need not seek long for the author's forthright sentiment — it will charm and disarm many readers. A chapter of descriptive thermonuclear physics is included in the early third of the book that does not distract from the memoir. It complements the narrative but can be

skipped as the author courteously mentions. It is preceded by a review of the discoveries of radioactivity and early atomic physics. Overall, and despite its heady title, *Building the H Bomb* is a good, light, airy read that is straightforward, compact, and sincere if just a tad short on emotional impact.