

Science

Hydrogen Bomb Physicist's Book Runs Afoul of Energy Department

By WILLIAM J. BROAD

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The first test of the hydrogen bomb was conducted at Elugelab, a Pacific island that was destroyed by the blast in 1952. Credit Los Alamos National Laboratory

PHILADELPHIA — For all its horrific power, the atom bomb — leveler of Hiroshima and instant killer of some 80,000 people — is but a pale cousin compared to another product of American ingenuity: the hydrogen bomb.

The weapon easily packs the punch of a thousand Hiroshimas, an unthinkable range of destruction that lay behind the Cold War's fear of mutual annihilation. It was developed in great secrecy, and Washington for decades has done everything in its power to keep the details of its design out of the public domain.

Now, a physicist who helped devise the weapon more than half a century ago has defied a federal order to cut from his new book material that the government says teems with thermonuclear secrets.

The author, Kenneth W. Ford, 88, spent his career in academia and has not worked on weapons since 1953. His memoir, "Building the H Bomb: A Personal History," is his 10th book. The others are physics texts, elucidations of popular science and a reminiscence on flying small planes.

He said he included the disputed material because it had already been disclosed elsewhere and helped him paint a fuller picture of an important chapter of American history. But after he volunteered the manuscript for a security review, federal officials told him to remove about 10 percent of the text, or roughly 5,000 words.

"They wanted to eviscerate the book," Dr. Ford said in an interview at his home here. "My first thought was, 'This is so ridiculous I won't even respond.' "

Instead, he talked with federal officials for half a year before reaching an impasse in late January, a narrative he backs up with many documents laid out neatly on his dining room table, beneath a parade of photographs of some of his seven children and 13 grandchildren.

World Scientific, a publisher in Singapore, recently made Dr. Ford's book public in electronic form, with print versions to follow. Reporters and book review editors have received page proofs.

The Department of Energy, the keeper of the nation's nuclear secrets, declined to comment on the book's publication.

But in an email to Dr. Ford last year, Michael Kolbay, a classification officer at the agency, warned that the book's discussion of the "design nuances of a successful thermonuclear weapons program" would "encourage emerging proliferant programs," a euphemism for aspiring nuclear powers.

In theory, Washington can severely punish leakers. Anyone who comes in contact with classified atomic matters must sign a nondisclosure agreement that warns of criminal penalties and the government's right to "all royalties, remunerations and emoluments" that result from the disclosure of secret information.

But the reality is that atomic pioneers and other insiders — in talks, books, articles and television shows — have divulged many nuclear secrets over the decades and have rarely faced any consequences.

The result is a twilight zone of sensitive but never formally declassified public information. The policy of the Energy Department is never to acknowledge the existence of such open atomic secrets, a stance it calls its "no comment" rule.

Yet in preparing his book, Dr. Ford deeply mined this shadowy world of public information. For instance, the federal agency wanted him to strike a reference to the size of

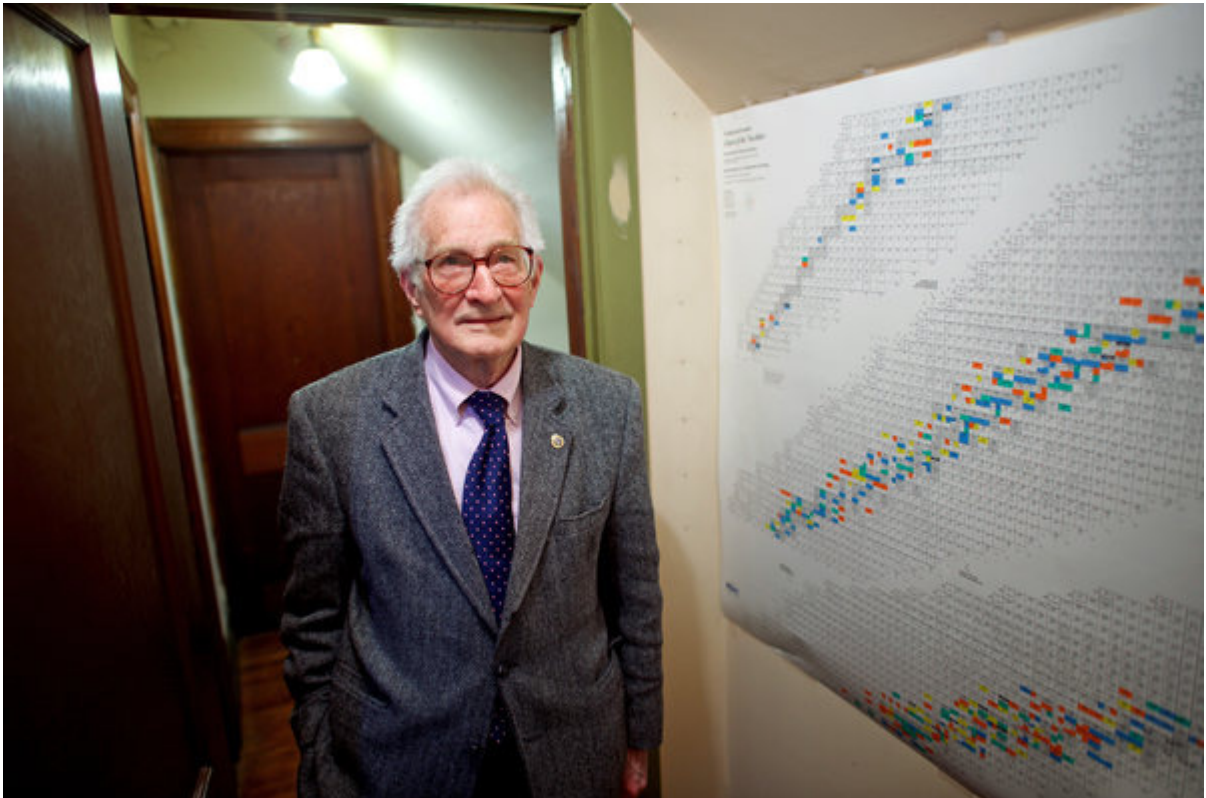
the first hydrogen test device — its base was seven feet wide and 20 feet high. Dr. Ford responded that public photographs of the device, with men, jeeps and a forklift nearby, gave a scale of comparison that clearly revealed its overall dimensions.

Steven Aftergood, director of the Project on Government Secrecy for the Federation of American Scientists, a private group in Washington, said he had received page proofs of Dr. Ford's book and expected that many of its details had run afoul of what he characterized as the agency's classification whims.

"There are probably real issues intertwined with spurious bureaucratic nonsense," Mr. Aftergood said.

He added that it would not be surprising if the Department of Energy did nothing in response to the book's publication. "Any action," Mr. Aftergood said, "is only going to magnify interest."

In 1979, the department learned that the hard way when it tried to block a magazine's release of H-bomb secrets; its failure gave the article a rush of free publicity.



Kenneth W. Ford at home in Philadelphia. He recently wrote his memoir: "Building the H Bomb: A Personal History." Credit Mark Makela for The New York Times

A main architect of the hydrogen bomb, Richard L. Garwin, whom Dr. Ford interviewed for the book, describes the memoir in its so-called front matter as "accurate as well as entertaining."

In an interview, Dr. Garwin said he recalled nothing in the book's telling of hydrogen bomb history that, in terms of public information, "hasn't been reasonably authoritatively stated." Still, he said, his benign view of the book "doesn't mean I encourage people to talk about such things."

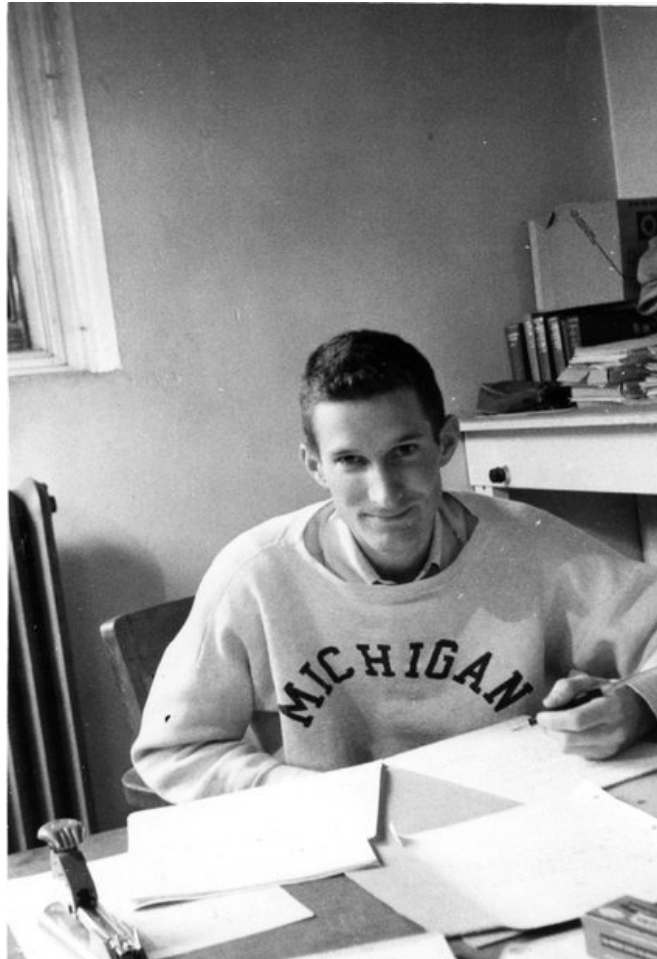
Hydrogen bombs are the world's deadliest weapons. The first test of one, in November 1952, turned the Pacific isle of Elugelab, a mile in diameter, into a boiling mushroom cloud.

Today, Britain, China, France, Russia and the United States are the only declared members of the thermonuclear club, each possessing hundreds or thousands of hydrogen bombs. Military experts suspect that Israel has dozens of them. India, Pakistan and North Korea are seen as interested in acquiring the potent weapon.

Though difficult to make, hydrogen bombs are attractive to nations and militaries because their fuel is relatively cheap. Inside a thick metal casing, the weapon relies on a small atom bomb that works like a match to ignite the hydrogen fuel.

Dr. Ford entered this world by virtue of elite schooling. He graduated from Phillips Exeter Academy in 1944 and Harvard in 1948. While working on his Ph.D. at Princeton, he was drawn into the nation's hydrogen bomb push by his mentor, John A. Wheeler, a star of modern science.

Dr. Ford worked in the shadow of Edward Teller and Stanislaw Ulam, bomb designers at the Los Alamos lab in New Mexico. Early in 1951, they hit on a breakthrough idea: using radiation from the exploding atom bomb to generate vast forces that would compress and heat the hydrogen fuel to the point of thermonuclear ignition.



Dr. Ford at Princeton in 1952. His work on the development of the hydrogen bomb involved calculating the likelihood that the compressed fuel would burn thoroughly and estimating the bomb's explosive power.

From 1950 to 1952, Dr. Ford worked on the project, first at Los Alamos and then back at Princeton. Among other things, he calculated the likelihood that the compressed fuel would burn thoroughly and estimated the bomb's explosive power.

He received his doctorate in 1953, and remained in academia, teaching at such schools as Brandeis; the University of California, Irvine; and the University of Massachusetts Boston.

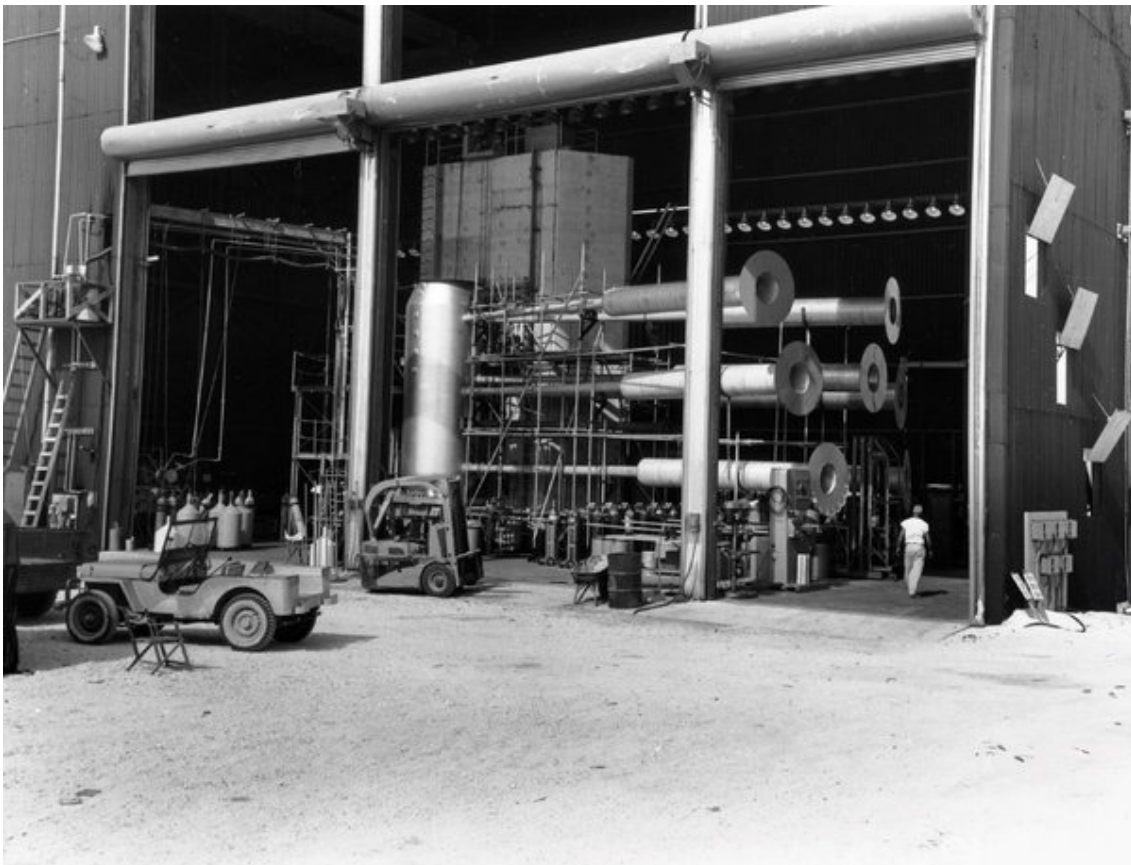
In the interview at his home, he said he was researching his H-bomb memoir when a historian at the Department of Energy suggested that he submit the manuscript for classification review. He did so, and in August, the agency responded.

"Our team is quite taken with your manuscript," an official wrote. "However, some concerns have been identified."

In late September, Dr. Ford met with agency officials. Afterward, in an email, he told them that he remained convinced the book "contains nothing whatsoever whose dissemination could, by any stretch of the imagination, damage the United States or help a country that is trying to build a hydrogen bomb."

On Nov. 3, Andrew P. Weston-Dawkes, director of the agency's office of classification, wrote Dr. Ford to say that the review had "identified portions that must be removed prior to publication."

The ordered cuts, 60 in all, ranged from a single sentence to multiple paragraphs, and included endnotes and illustrations.



The first hydrogen bomb in its construction shed on Elugelab, which was later vaporized by the bomb's blast in 1952. Credit Los Alamos National Laboratory

“Were I to follow all — or even most — of your suggestions,” Dr. Ford wrote in reply, “it would destroy the book.”

In December, he told the department he would make a few minor revisions. For instance, in two cases he would change language describing the explosive yields of bomb tests from “in fact” to “reportedly.” After much back and forth, the conversation ended in January with no resolution, and the book’s publisher pressed on.

The government’s main concern seems to center on deep science that Dr. Ford articulates with clarity. Over and over, the book discusses thermal equilibrium, the discovery that the temperature of the hydrogen fuel and the radiation could match each other during the explosion. Originally, the perceived lack of such an effect had seemed to doom the proposed weapon.

The breakthrough has apparently been discussed openly for years. For instance, the National Academy of Sciences in 2009 published a biographical memoir of Dr. Teller, written by Freeman J. Dyson, a noted physicist with the Institute for Advanced Study in Princeton, N.J. It details the thermal equilibrium advance in relation to the hydrogen bomb.

At his home, Dr. Ford said he considered himself a victim of overzealous classification and wondered what would have happened if he had never submitted his manuscript for review.

“I was dumbfounded,” he said of the agency’s reaction to it.

Dr. Ford said he never intended to make a point about openness and nuclear secrecy — or do anything other than to give his own account of a remarkable time in American history.

“I don’t want to strike a blow for humankind,” he said. “I just want to get my book published.”

Correction: March 23, 2015

An earlier version of this article misspelled the surname of the director of the Department of Energy’s office of classification, who wrote to Dr. Ford in November. He is Andrew P. Weston-Dawkes, not Weston-Davis.

A version of this article appears in print on March 24, 2015, on page D1 of the New York edition with the headline: A Memoir’s Fallout.