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Theodore Taylor, a Designer of A-Bombs Who Turned Against Them, Dies at 79

By Margalit Fox

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Theodore Taylor, a theoretical physicist who spent his early career as a designer of streamlined nuclear weapons and his later career as an antinuclear campaigner, died on Oct. 28 at a nursing home in Silver Spring, Md. He was 79 and until recently lived in the western New York community of Wellsville.

The cause was complications of coronary artery disease, his family said.

Dr. Taylor, who worked at the Los Alamos National Laboratory at the height of the cold war, was renowned as a designer of fission bombs of minimal size and maximal bang. He later directed Project Orion, whose mission was to develop a nuclear-powered interplanetary spacecraft.

"His trade, basically, was the miniaturizing of weapons," the physicist Freeman Dyson says in "The Curve of Binding Energy" (Farrar, Straus & Giroux, 1974), a book-length profile of Dr. Taylor by John McPhee. "He was the first man in the world to understand what you can do with three or four kilograms of plutonium, that making bombs is an easy thing to do, that you can, so to speak, design them freehand."

But by the mid-1960's, Dr. Taylor had become, in his own words, a "nuclear dropout." A frequent adviser on nuclear safeguards, he wrote and lectured widely on the threat of nuclear terrorism and the risks of nuclear power. He believed that a small clandestine group, or even an individual, could easily steal nuclear material and, with publicly available information, build a homemade atomic bomb.

"The nuclear genie has proliferated considerably since it was first released," he said in a 1996 lecture. His mission, he often stated, was to put it back into the bottle, and by the end of his life he had become an archetypal figure: the creator compelled to destroy his own creation after it runs menacingly amok.

Theodore Brewster Taylor was born on July 11, 1925, in Mexico City. His grandparents had been missionaries, and his father was general secretary of the Y.M.C.A. in Mexico. A brilliant boy (he completed sixth grade the same year he started fourth), Ted was enthralled by his chemistry set, or, more precisely, its explosive possibilities.

"He enjoyed putting potassium chlorate and sulfur under Mexico City streetcars," Mr. McPhee wrote. "There was a flash, and a terrific bang."

Dr. Taylor received a bachelor's degree from the California Institute of Technology in 1945 and pursued a doctorate in physics at the University of California. But he failed his oral examinations -- he lacked the capacity to focus on things that did not interest him -- and he left the department in 1949. (He would eventually earn a Ph.D. from Cornell in 1954.)

He found a job at Los Alamos. "Within a week, I was deeply immersed in nuclear weaponry," Dr. Taylor wrote in a 1996 article in Bulletin of the Atomic Scientists. "I was fascinated by every bit of information I was given during those first few days."

Preternaturally inept at ordinary tasks (parking a car defeated him), he became an artist of the fission bomb, taking the massive nuclear weapons developed for the Manhattan Project and making them smaller and lighter without sacrificing explosive power. Over the next seven years, he designed a series of ever-smaller bombs, whose cunning names -- Scorpion, Wasp, Bee, Hornet -- captured both their size and their sting.

Dr. Taylor would develop the smallest fission bomb of its time, Davy Crockett, which weighed less than 50 pounds. (By contrast, Little Boy, dropped on Hiroshima, weighed almost 9,000 pounds.) At the other extreme, he designed Super Oralloy, which was at the time, Mr. McPhee wrote, "the largest-yield pure-fission bomb ever constructed in the world."

Viewed as a theoretical abstraction, Dr. Taylor's work had a cool, compelling elegance. Exploded in the Nevada desert, it made a satisfying flash and bang. The weapons, he often reminded himself, were meant to deter nuclear war, and if the United States did not develop them, the Soviets soon would.

In his 1996 article, he recalled how he spent Nov. 15, 1950, the day his daughter Katherine was born:

"Instead of being with my wife, Caro, I had spent the day at a military intelligence office, poring over aerial photographs of Moscow, placing the sharp point of a compass in Red Square and drawing circles corresponding to distances at which moderate and severe damage would result from the explosion at different heights of a 500-kiloton made-in-America bomb. I remember feeling disappointed because none of the circles included all of Moscow."

Dr. Taylor's marriage, to the former Caro Arnim, whom he wed in 1948, ended in divorce in 1992. He is survived by their five children: Clare Hastings of Washington; Katherine Robertson of Davis, Calif.; Christopher, of Colorado Springs; Robert, of Rockville, Md.; and Jeffrey, of Brooklyn; two half-brothers, John Barber of Irvine, Calif., and Ralph Thompson of Issaquah, Wash.; 10 grandchildren; and 9 great-grandchildren.

In 1956, Dr. Taylor left Los Alamos to work on Orion. The size of a 16-story building, Orion was to be propelled by 2,000 nuclear bombs, ejected one by one from the bottom of the spaceship (the designers modeled this feature on the technology of Coke machines) and detonated in space. He dreamed of visiting Mars and Saturn, but the Limited Test Ban Treaty of 1963, which banned nuclear explosions in the atmosphere and in space, put an end to the project.

In the late 1950's, working for a division of General Dynamics, Dr. Taylor and several colleagues developed Triga, a small reactor used for research and considered safer than conventional reactors.

In 1964, he went to work for the Defense Department as deputy director of the Defense Atomic Support Agency. There, he later said, he came to see the real-world implications of the elegant little bombs he had designed at Los Alamos.

"I became privy to the actual characteristics and deployments of what, by then, were thousands of nuclear weapons," he wrote in 1996. "The nuclear arms race had a force and a momentum I had never dreamed of."

He left in 1966 and the following year started the International Research and Technology Corporation, a consulting business. In 1980 he started Nova Inc., which developed alternatives to nuclear energy.

His books include "The Restoration of the Earth" (1973, with Charles C. Humpstone), "Nuclear Theft: Risks and Safeguards" (1974, with Mason Willrich) and "Nuclear Proliferation: Motivations, Capabilities and Strategies for Control" (1977, with Ted Greenwood and Harold A. Feiveson).

He also taught at Princeton for a number of years, and was a member of the president's commission on the Three Mile Island accident.

Dr. Taylor approached his work with the zeal of a convert and, perhaps, the attitude of a penitent.

"Rationalize how you will, the bombs were designed to kill many, many people," he says in Mr. McPhee's book. "If it were possible to wave a wand and make fission impossible -- fission of any kind -- I would quickly wave the wand."

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