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EDWARD TELLER, PH.D.

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FATHER OF THE HYDROGEN BOMB

"IF I claim credit for anything, I should not claim credit for knowledge but for courage."

~ Inducted: 1961 ~

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Edward Teller Biography

Father of the Hydrogen Bomb

Print Biography

Edward Teller Date of birth: January 15, 1908
Date of death: September 9, 2003

STATESMAN OF SCIENCE

Edward Teller was born into an affluent, educated Jewish family in Budapest, Hungary. As one of the great cities of the Austro-Hungarian Empire, Budapest was part of a larger central European world of predominantly German language and culture. Edward was only ten when the First World War brought an end to the Empire and Hungary became independent for the first time in centuries.

Young Edward was a mathematical prodigy, educated in private schools, but his education was frequently disrupted by the political turmoil engulfing the new nation. In 1926, Edward left Budapest to study chemical engineering in Karlsruhe, Germany.

In Karlsruhe, Teller became intrigued by physics, particularly the new theory of quantum mechanics. The young chemical engineer transferred to the University of Munich in 1928 to pursue this interest. In Munich, disaster struck. A streetcar accident cost Teller his right foot.

Once Teller had recovered from his injury and learned to walk with a prosthesis, he transferred to the University of Leipzig to study with Werner Heisenberg, who was in the forefront of the new physics. Teller received his doctorate in physics in 1930 and took a job as research consultant at the

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University of Göttingen. His first published paper, "Hydrogen Molecular Ion," was one of the earliest statements of what is still the most widely held view of the molecule.

Teller might have settled down to a long, productive career in Germany, but again political events intervened. Adolf Hitler came to power in Germany and Teller knew immediately that there was no future for him in Germany. With the help of the tight-knit community of advanced physicists, Teller was able to emigrate to Denmark in 1934. There he joined the Institute for Theoretical Physics, where the great Niels Bohr led a team of young scientists attempting to unlock the secrets of the atom. In this year, Teller married Augusta Harkanyi, a marriage that weathered half a century of expatriation and controversy.

At Bohr's institute, Teller met the Russian physicist George Gamow, also a political refugee. After a year, Gamow and Teller went their separate ways. Gamow headed for George Washington University in Washington, D.C., while Teller headed for England. He worked briefly at the University of London, but within a year received an invitation to join Gamow in Washington. Teller gratefully accepted the offer and entered the United States in 1935; he became a naturalized U.S. citizen in 1941.

In Washington, Teller and Gamow worked together closely, formulating the so-called Gamow-Teller rules for classifying subatomic particle behavior in radioactive decay. They also attempted to apply the new understanding of atomic phenomena to astrophysics. Teller had settled down to what he hoped would be a quiet academic life, but events in Europe intervened again.

The development of nuclear physics had continued at a slower pace in Hitler's Germany, but by 1939, German scientists had discovered nuclear fission. It was theoretically pssible to split the atom, releasing energy as heat. It appeared to Teller and the other refugee physicists that the most destructive force ever known to man might fall into the hands of Adolf Hitler. Their fear was amplified by the knowledge that the German nuclear program was led by Heisenberg himself.

Teller's friend Leo Szilard enlisted Albert Einstein to bring this danger to the attention of President Franklin Roosevelt. Roosevelt appealed to the scientific community to mobilize for the defense of freedom. In 1941 Teller joined America's best physicists in the top secret Manhattan Project. Their mission: to develop the atom bomb before the Germans did.

After preliminary work in Chicago with Enrico Fermi, and in Berkeley with J. Robert Oppenheimer, Teller moved to the isolated laboratory at Los Alamos, New Mexico. Here, under Oppenheimer's leadership, the first atomic bomb would be built.


SANTA FE NEW MEXICAN

Los Alamos Secret Disclosed by Truman

ATOMIC BOMBS DROP ON JAPAN

As early as 1940, Teller had considered the possibility of using the intense heat generated by nuclear fission to trigger the process called nuclear fusion, an even more explosive phenomenon. Teller hoped that both the fission and fusion options would be pursued at Los Alamos, but building the simpler fission device alone

proved so complicated that fusion research was abandoned. Teller was deeply disappointed.

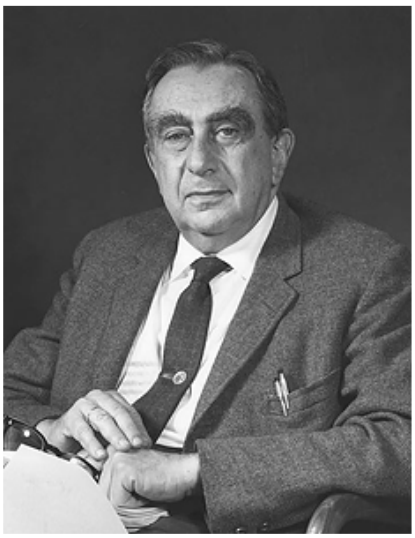
Edward Teller made a major contribution to the development of the atomic bomb. From the beginning, some scientists had feared that an uncontrolled nuclear reaction, like that of the proposed bomb, might continue indefinitely, consuming the earth. Teller's calculations reassured the team that the nuclear explosion, while enormously powerful, would only destroy a limited area.

In 1945, the atom bomb was successfully tested at Alamogordo, New Mexico. The German project was nowhere near completion when Germany surrendered. Within weeks of the first test, America's bombs had destroyed the Japanese cities of Hiroshima and Nagasaki. Japan surrendered and the war was over. Once the war was over, Teller tried again, without success, to persuade his superiors at Los Alamos to pursue fusion and create a thermonuclear weapon vastly more powerful than the bombs dropped on Japan.

When the Russians detonated their own atomic bomb, President Harry S. Truman ordered the Los Alamos lab to develop a fusion weapon. In 1952, the first hydrogen bomb was successfully detonated on Eniwetok Atoll in the Pacific Ocean. Teller felt vindicated, but Oppenheimer and many of the Manhattan Project veterans had opposed the plan. A deep and bitter rift developed between two factions of atomic scientists.

Teller believed the scientists at Los Alamos were too ambivalent about developing the next generation of nuclear weapons, and that an independent facility was needed. He lobbied Congress and the armed services vigorously for the establishment of a second laboratory for thermonuclear research. The Atomic Energy Commission responded by establishing the Lawrence Livermore Laboratory in northern California. Teller served in succession as consultant, associate director and finally director of the Livermore lab.

A deeper antagonism between Teller and many of his former colleagues developed when J. Robert Oppenheimer was accused of disloyalty on the basis of some past associations. Teller made no accusations himself, but when Oppenheimer's security clearance was revoked, many of his friends blamed Teller.



Over the years, Teller continued to advocate a strong national defense. He made headlines in the 1970s, promoting the development of nuclear fusion as an alternative to other sources of energy, and again in the 1980s, testifying in favor of the strategic missile defense system. He was the author of over a dozen books, mostly dealing with nuclear energy and defense issues. From 1975, Edward Teller was a senior research fellow at the Hoover Institute for the Study of War, Revolution and Peace at Stanford University in Palo Alto, California. He died at his home on the University campus at the age of 95.

Listen to Dr. Edward Teller play a Beethoven *Sonata* at his home on Stanford University's campus on September 30, 1990.

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