

Patriot Project

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A Teaching American History Grant

The following is information synthesized from the World War II information boards created by Patriot Project Participants on September 11, 2010. Additional information/sources may be added in some cases.

Little Boy and Fat Man

Carol Laramore & Alice Marshall

The discovery of fission in early in 1939 made atomic bombs possible. When the great Danish physicist, Niels Bohr, announced the discovery of fission to the world, many scientists became alarmed by the prospect that Germany would use fission to develop a Nazi atomic bomb. Albert Einstein wrote to President Franklin Roosevelt advising the president of such a possibility. Einstein's letter led to the creation of the Manhattan Project as well as the Los Alamos Laboratory.

In the summer of 1942, J. Robert Oppenheimer convened a study conference in his University of California offices to explore the possibility of developing an atomic bomb. Attended by such notable physicists as Hans Bethe and Edward Teller, the conferees concluded that an atomic bomb was possible by use of a military cannon to shoot one piece of uranium or plutonium at a second piece of the same material. When the two pieces of material collided, a nuclear explosion would follow.

Based on the conclusion of the Berkeley summer conference, that gun technology was both well understood and relatively simple, early Los Alamos efforts centered on developing a gun-type bomb. Since plutonium was a much more difficult material to work with than uranium, Oppenheimer further concentrated work on a gun using plutonium. This early gun type was known by its codename, Thin Man.

Emilio Segrè discovered in the spring of 1944 that light element impurities in plutonium, which could not be eradicated, would cause a premature, low-order detonation of a plutonium gun bomb - a fizzle. This discovery, known as spontaneous fission, was devastating. Already facing a crippling shortage of uranium, a combat atomic bomb might be significantly delayed or not available for use during the war at all.

Recognizing that a supersonic shock wave created by high explosives could be used to implode, or crush, a ball of plutonium (to initiate a fission chain reaction), Oppenheimer reorganized Los Alamos in August 1944. He refocused most of the laboratory's efforts on developing a successful method to implode plutonium. By early spring 1945, the design for the implosion gadget was set. This new plutonium bomb, called Fat Man, was such a radical departure from established technology that doubts about its success made necessary the test, codenamed Trinity, conducted in July 1945.

Although most of the effort at Los Alamos centered on implosion development, work continued on a uranium gun device, which was renamed Little Boy. Uranium presented few technical problems, and success seemed certain enough that no proof test of Little Boy was required. Since only enough uranium was available in 1945 for one bomb, a test would have kept Little Boy out of combat.

Little Boy exploded over Hiroshima with a force of approximately fourteen kilotons on August 6, 1945. Fat Man exploded over Nagasaki with a force of twenty kilotons on August 9, 1945. The use of atomic bombs against Japan ended World War II and inaugurated the nuclear age.

<http://www.lanl.gov/history/atomicbomb/littleboyandfatman.shtml>

Quotes

Inscription on Memorial Cenotaph in Hiroshima Peace Park

“Let all souls here rest in peace, for we shall not repeat the evil.”

From *Hiroshima Diary* by Michihiko Hachiya August 8, 1945

Towards evening a light, southerly wind blowing across the city wafted to us an odor suggestive of burning sardines. I wondered what could cause such a smell until somebody, noticing it too informed me that sanitation teams were cremating the remains of people who had been killed.

Looking out, I could discern numerous fires scattered about the city. Previously I had assumed the fires were caused by burning rubble. Towards Nigitsu was an especially large fire where the dead were being burned by the hundreds. Suddenly to realize that these fires were funeral pyres made me shudder and I became a little nauseated.

Key Personnel

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| Robert Oppenheimer | Scientist and Manhattan Project designer |
| Col. Paul W. Tibbits | Pilot of the Enola Gay which carried the Little Boy atomic bomb to Hiroshima |
| Major Charles Sweeny | Pilot who flew the Fat Man atomic bomb to Nagasaki |

Sources

<http://www.bing.com/search?q=little+boy+and+fat+man+atomic+bombs&src=IE-SearchBox&FORM=IE8SRC>

<http://nuclearweaponarchive.org/Usa/EnolaGay/EnolaGay.html>

<http://nuclearweaponarchive.org>

<http://www.atomicarchive.com/History/twocities/nagasaki/page2.shtml>

<http://www.nationalarchives.gov>