**THE MANHATTAN PROJECT AND HIROSHIMA**

“I am become Death, the destroyer of worlds” J. Robert Oppenheimer quoting Hindu Scripture @ Trinity

**THEORY BECOMES REALITY**

* Berlin 1938: Otto Hahn (1879-1968) discovers a phenomenon he can’t explain. Lise Mettner (1878-1968) tells him he split the atom.
* Chicago 1942: University of Chicago under the stands at Stagg Field Enrico Fermi (1901-1954) 1938 Nobel Prize winner creates the first nuclear chain reaction using uranium.
* England: Ernest Rutherford godfather of the world’s physicists considered atomic energy “moonshine “because he believes atomic energy for power or bombs is a pipedream.
* Washington: Albert Einstein (1879-1955) and Leo Szilard (1898-1964) write famous letter to FDR in 1939 warning of a Nazi A-Bomb, nothing is done until 1942.
* Mark Oliphant from Britain comes to the USA to urge greater speed in bomb development.
* General Leslie Richard Groves (1896-1970) US Army Corps of Engineers after building the Pentagon gets job to build the bomb

**ATOM CITIES W X Y – The Manhattan Project cost 2 billion dollars in 1940’s dollars.**

* Code name **W Hanford, WA** location for producing Plutonium.
* Code name **X: Oak Ridge, TN** separate U-235 from natural uranium
* Code name **Y: Los Alamos, NM** where the bomb will be invented.

The army turned a boy’s school into secret city, a concentration camp of Nobel winners.

The nation’s brightest nuclear physicists moved into teacher’s homes “Bathtub Row.”

**THE MAN BEHIND THE BOMB – j. Robert Oppenheimer**

* J Robert Oppenheimer (1904-1967) At Univ of California in Berkeley Oppie is admired Professor

Wife Katherine “Kitty” Puening (1910-1972) German her 4th marriage difficult controversial

Mistress Jean Tatlock (1914-1944) Communist, Psychiatrist, security risk, suicide

**LOS ALAMOS: THE OPPENHEIMER TEAM**

* Isidor I Rabi (1898-1988) Hungarian was Oppie’s most senior advisor.
* Hans Bethe (1906-2005) German American was principal theoretician.
* Enrico Fermi (1901-1954) Italian American was chief experimentalist
* George Kistiakowsky (1900-1982) Ukrainian American explosives expert.
* John von Neumann (1903-1957) Hungarian American calculated the mathematics.
* Victor Weisskopf (1908-2002) Austrian American tried to assess the radiation.
* Edward Teller (1908-2003) Hungarian American wanted bigger bomb, father of the H-Bomb
* Robert Wilson (1914-2000) wanted a peaceful demonstration of bomb – first Fermi lab director.
* Seth Neddermeyer (1907-1988) invented the implosion type nuclear weapon.
* Joseph Rotblat (1908-2005) Polish British only scientist to resign Manhattan Project opposed use
* Klaus Fuchs (1911-1988) German British Soviet Spy, Soviets develop A-Bomb in 1949
* Harry Daghlian (1921-1945) Daghlian was irradiated as a result of a [criticality accident](https://en.wikipedia.org/wiki/Criticality_accident) that occurred when he accidentally dropped a [tungsten carbide](https://en.wikipedia.org/wiki/Tungsten_carbide) brick onto a 6.2 kg [bomb core](https://en.wikipedia.org/wiki/Pit_%28nuclear_weapon%29) made of [plutonium–gallium alloy](https://en.wikipedia.org/wiki/Plutonium%E2%80%93gallium_alloy). This core, subsequently nicknamed the "[demon core](https://en.wikipedia.org/wiki/Demon_core)", was later involved in the death of another physicist, [Louis Slotin](https://en.wikipedia.org/wiki/Louis_Slotin) (1910-1946)

**ALL NATIONS ARE TRYING TO BUILD THE ATOM BOMB**

* Britain: code name “Tube Alloys” becomes part of Manhattan after US joins war – underfunded.
* Germany: US thought Nazis with 18-month head start would get there first.

Werner Heisenberg (1901-1976) pioneer in quantum mechanics leader of Nazi Bomb project

* Japan: Yoshio Nishina (1890-1951) was ordered to build bomb for Japan.
* Russia: Igor “The Beard” Kurcharov (1903-1960) relied on design data supplied by Fuchs, called the father of soviet A-bomb.

**THE TRINITY TEST July 16, 1945**

* Two bomb designs – Uranium fission and Plutonium fusion – only enough for 2 bombs now
* Little Boy: Uranium Fission U235 they know this will work no need to test it.
* Fat Man: Plutonium implosion must be tested, not sure if it will explode.
* Test site called Trinity picked for its isolation, device exploded from tower.
* Fireball creates blast of 25 kilotons.

**DECISION AT POTSDAM**

* July 1945 new in office after FDR death, President Harry Truman (1884-1972) meets with Churchill and Stalin at Potsdam Conference
* Truman is told by coded message that the Trinity Test was a success – he becomes confident & Japan is told to surrender, the [ultimatum](https://en.wikipedia.org/wiki/Ultimatum) stated that, if Japan did not surrender unconditionally, it would face "prompt and utter destruction.” and the Soviets to enter war by invading Manchuria and Korea, the Japanese had been trying to get the Soviets to broker peace.

**TINIAN IN MARIANAS: THE BOMB GOES OPERATIONAL**

* Little Boy transported from SF to Tinian via USS Indianapolis (after delivery it is sun by sub)
* The Target Committee - Kyoto was seen as an ideal target by the military because it had not been bombed at all, so many of the industries were relocated and some major factories were there - The scientists also preferred Kyoto because it was home to many universities- it was the ancient capital of Japan and had political and spiritual importance to the Japanese people.
* But in early June 1945, Secretary of War Henry Stimson (1867-1950) ordered Kyoto to be removed from the target list. He argued that it was of cultural importance and that it was not a military target – He and his wife had vacationed there in 1926
* Hiroshima was chosen from list of 11 cities not yet burned by General Curtis LeMay (1906-1990) and bombed because its weather was clear. Nagasaki also on the list.
* Ordinance Chief Deke Parsons (1901-1953) decided to arm the weapon in flight to Hiroshima.
* Colonel Paul Tibbets (1915-2007) piloted the first bomb mission.
* 509th Composite Group had trained specifically to deliver the A-bomb.
* Tibbets plane the B-29 *Enola Gay* was named for his mother.

**HIROSHIMA: THE DEATH CITY**

* August 6, 1945, 8:16 am Hiroshima is destroyed by Little Boy bomb.
* The bomb missed its aiming point, the T-shaped Aioi Bridge by only 800 feet.
* Little Boy Bomb killed 126000 civilians, 20,000 military, 12 Allied POW
* Colonel Seiichi Niizuma was sent to Hiroshima to see if Truman claim that the bomb is atomic.

**NAGASAKI BOMBING THREE DAYS LATER August 9, 1945**

* Three days later with no surrender Nagasaki is bombed with Fat Man Plutonium fusion bomb
* Fat Man Bomb killed 80,000 civilians, 150 military, 13 Allied POW
* Emperor Hirohito (1901-1989) is able to maneuver his ministers into surrender.

*“Decades have passed since the United States dropped two atom bombs on Japan, but the debate over the morality of Harry S. Truman’s decision has hardly dimmed. Did ending the war in the Pacific justify the obliteration of between 100,000 and 200,000 lives?”* Historian Robert Crowley What If?

**FILMS**

“Fat man and Little Boy” directed by Roland Joffe 1989

“Oppenheimer” directed by Christopher Nolan 2023

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