

The History of the Atomic Bomb

Syllabus

Text: Tamara L. Roleff, editor: *The Atom Bomb* (San Diego, CA: Greenhaven Press, 2000)

Primary References:

Richard Rhodes: *The Making of the atomic Bomb* (New York: Simon & Schuster, 1986)

Robert Serber: *The Los Alamos Primer: The First Lectures on How to Build an Atomic Bomb* (Berkeley: University of California Press, 1992)

Jeremy Bernstein: *Hitler's Uranium Club: The Secret Recordings at Farm Hall* (New York: AIP Press, 1996)

First Day

Morning: "Thirty Years that Shook Physics" 1896-1932

The players: Becquerel & the Curies—Radioactivity

J. J. Thomson—the Electron

Planck—quantum of energy

Einstein— $E = mc^2$ & the quantum of light

Rutherford—nuclear atom

Bohr—first quantum theory

Moseley—Atomic numbers & Isotopes

Meitner & Chadwick—beta decay energies

Heisenberg & Schrödinger—modern quantum theory

Chadwick—neutron

Afternoon: TV Movie "Day One"

Read for Second Day: "A Brief History of the Atom bomb," pp. 12-16, through the section titled "The Worry About the Germans," and "The Discovery of Fission," by C. P. Snow, pp. 36-45 in Roleff, prepare Discussion question #1 of Chapter 1, p. 251

Second Day

Morning: "The Gathering Storm" 1932-1940

The players: Szilard—chain reaction

Lawrence—cyclotron

Fermi—nuclear processes, beta decay

Joliot-Curies—Artificial radioactivity

Hahn & Meitner—fission

Bohr—nature of fission

Einstein—letters to Roosevelt

Frisch & Peierls: Critical Mass

Afternoon: TV Biography "Oppenheimer," parts 1 & 2

Selecting presentation topic

Read for third day: pp. 16-17, "The United States Commits to the Atomic bomb Project," pp.20-21, "The Work at Los Alamos," and pp. 46-55 and 67-85, in Roleff, prepare discussion questions for Ch 1, ##2, 4 and 5, p. 251

Third Day

Morning: "The War Years," 1941-46

The players: Oppenheimer—Los Alamos

Serber—Chief Lieutenant

Fermi—reactor

Szilard—the activist

Bethe—Theorv

Teller—The “Super”
Groves—the guy what’s in charge
Neddermeyer and Kistiakowski—implosion
Lawrence—isotope separation

Afternoon: “Oppenheimer,” parts 3 & 4

Read for Fourth day: pp. 17-20, “The German Bomb” and “The Alsos Project,” and Essay 3 of Ch 1, “The Race to Make the Bomb,” pp. 56-66, in Roleff.

Fourth Day

Morning: “Heisenberg’s War: The German Atomic Bomb Project” 1939-45

The Players Heisenberg—To bomb or not to bomb?
von Weizsäcker—the possibility of a bomb
Hahn—”What have I wrought?”
Diebner—Fission research
Wirtz.—Reactor design
Bothe—Measuring the nucleus, moderator
Goudsmit—Alsos

Afternoon: “Oppenheimer,” part 5, and animated movie, “Barefoot Gen”
Continue Preparation of Presentations

Read for Fifth day: pp. 30-31, “Espionage,” in Roleff

Fifth Day

Morning: “When in Doubt, Plagiarize: The Russian Atomic Bomb Project” 1942-49

The Players Beria—The Paranoid at the top
Kurchatov—In charge of it all
Kapitza—wasted talent
Khariton and Zeldovich—the theoreticians
Kikoin and Alikhanov—the experimenters
Fuchs, *et. al.*—The spies

Afternoon: Documentary: “The Day After Trinity”

Read for the Sixth day: pp. 21-26, “Truman Becomes President,” “Trinity,” “The Potsdam Conference,” and “Preparations to Drop the Bomb,” Chapter 2, “The Decision to Drop the Bomb,” pp. 87-126, prepare discussion questions for Ch. 2, p. 251 of Roleff

Sixth Day

Morning: The Decision to Drop the Bomb, and the effects on Hiroshima and Nagasaki

The Players: Truman—The Man in Charge
Stimson—Secretary of War
Groves—Building the bomb
Marshall—Chief of Staff
Oppenheimer—chief advisor
Burns—Secretary of State
And a stable of minor players

Afternoon: Movie, “Hiroshima”

Read for Seventh Day: pp. 26-30, “Hiroshima,” “Nagasaki” and “Surrender,” Chapter 3, “Aftermath,” pp. 128-147, and prepare discussion questions for Ch 3, p. 252, of Roleff.

Seventh Day

Morning: “The Post-war era and the Beginning of the Arms Race” 1945-60

The Players Teller and Ulam—the American bomb
Sakharov—The Russian bomb
Oppenheimer—The dissenter
Lewis Strauss—The Avenger
The politicians—a cast of thousands

Afternoon: Movie, “Black Rain”

Read for Eight Day: p. 30, “The Atomic Energy Commission,” and Chapter 5, “In Retrospect: Scientists Evaluate the Atomic Bomb,” pp. 180-212, prepare discussion questions for Ch. 5, p. 253.

Eighth Day

Morning: “The Cold War and the Disarmament Movement” 1960-Present

The Players: Bethe—The Moral Compass
LeMay—“Back to the Stone Age”
Sakharov—In Dissent
Teller—Star Wars
And a world of proliferators

Afternoon: “Oppenheimer,” parts 6& 7

Supplementary Material

Richard Rhodes: *Dark Sun: The Making of the Hydrogen Bomb* (New York: Simon & Schuster, 1995)

Peter Wyden: *Day One: Before Hiroshima and After* (New York: Simon & Schuster, 1984)

Nuel Pharr Davis: *Lawrence and Oppenheimer* (New York: Simon & Schuster, 1968)

David Cassidy: *Uncertainty: The Life and Science of Werner Heisenberg* (New York: Freeman, 1992)

Henry DeWolfe Smyth: *Atomic Energy for Military Purposes* (Peinceton: Princeton University Press, 1945; Reissued 1989 by Stanford University Press)

William Lanouette: *Genius in the Shadows: A Biography of Leo Szilard, the Man Behind the Bomb* (New York: Scribner's, 1992)

Robert Serber: *Peace & War: Reminiscences of a Life on the Frontiers of Science* (New York: Columbia University Press, 1998)

Samuel A Goudsmit: *Alsos* (New York, Schuman, 1947; Reissued 1986 by the American Institute of Physics)

Lawrence Badash, Joseph O. Hirschfelder and Herbert P. Broida, editors: *Reminiscences of Los Alamos, 1943-1945* (Boston, Reidel, 1980)

Paul Lawrence Rose: *Heisenberg and the Nazi Atomic Bomb Project: A Study in German Culture* (Berkeley: University of California Press, 1998)

Schweber, Sylvan. S., *In the Shadow of the Bomb: Oppenheimer, Bethe, and the Moral Responsibility of the Scientist* (Princeton, NJ: Princeton University Press, 2000)

Teller, Edward, *Memoirs: A Twentieth Century Journey in Science and Politics* (Cambridge, MA: Perseus, 2001)

Plus other books and articles