

HISC 111
“Origins of the Atomic Age”
Spring 2001, T Th 11:10-12:30

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Office Hours: Tuesdays 2-4 p.m. or by appointment

Synopsis The atomic bomb changed the world. After 1945, humans held in their hands the capacity for self-annihilation. How and why did this state of affairs come to pass? Why did scientists build the atomic bomb? What technical know-how made it possible? What moral and political circumstances made it seem desirable? Why was the bomb used at Hiroshima and Nagasaki? This course will address these questions in their technical, historical, and moral dimensions. Specific will include the technical basis of atomic weaponry, the initiation and organization of the Manhattan project, the bombings of Hiroshima and Nagasaki, nuclear proliferation, and the environmental and social legacies of the atomic age. We will attempt to understand how and why scientists built the atomic bomb, why President Truman used the bomb, and what lasting legacies we now live with from the atomic age.

Logistics This course is reading-intensive and some of the material we is hard, but you do **not** have to have a background in science to do well in this course. We will work through it together. My job is to help you come to terms with the material; your job is to ask questions when you don't understand what is going on, and to come to office hours if you are having problems. If you don't feel comfortable asking a question in lecture, please feel free to submit written questions by hand or by email. I will try to answer them promptly.

The graded work of the course consists of a mid-term, a final exam, and a 1- page term paper. The mid-term will be an open-book, take-home, essay-style exam. The final will be a closed-book exam at the time and place specified by the university. The paper will be paper on a topic of your choosing, due at the end of term. The purpose of the paper is to give you the opportunity to explore in greater detail a topic that interests you. After mid-term, you will be required to submit a one-page summary of your proposed topic, with preliminary references. Your paper **must** include scholarly footnotes or endnotes formatted according to the guidelines in the University of Chicago Press *Manual of Style*. I do not accept late papers except in cases of documented medical afflictions or family emergency.

Grading Midterm exam 30%, final exam 35%, term paper 35%.

Required texts. All required texts will be available at Groundworks books. Most are also available at commercial bookstores or through www.amazon.com. Check for discounts. A reading packet will be sold in class by the University Reader Printing Service. All books and the reader will also be on reserve at Geisel Library. If money is tight, buy Rhodes and Alperovitz and read the other materials in the library.

Alperovitz, Gar, *The Decision to Use the Atomic Bomb*. Random House, 1996.

Kevles, D.J., *The Physicists: The History of a Scientific Community in Modern America*. Harvard, 1977.

Rhodes, Richard, *The Making of the Atomic Bomb*. Simon and Schuster, 1986.

Badash, Lawrence, *Scientists and the Development of Nuclear Weapons*. Humanities Press, 1995.

Other recommended books (helpful for choosing term paper topics)

Blackett, P.M.S. *Fear, War And The Bomb*. McGraw-Hill, 1948. An early critique of nuclear deterrence written by a Nobel Laureate involved in the British atomic program.

Bernstein, Jeremy. *Hitler's Uranium Club: The Secret Recordings at Farm Hall*. American Institute of Physics, 1996. Transcripts of secret recordings of discussions among German nuclear physicists immediately after the war.

Boyer, Paul. *Fallout: A Historian Reflects on American Thought and Culture at the Dawn of the Atomic Age*. University of North Carolina Press, 1994. A cultural history of the early atomic age.

Bundy, McGeorge. *Danger and Survival: Choices about the Bomb in the First Fifty Years*. Vintage Books, 1988. An insider's history of American atomic policy by the man who helped War Secretary Henry Stimson write his memoirs, and later served as a national security advisor to President Kennedy.

Goudsmit, Samuel A. *Alsos*. American Institute of Physics, 1996 (originally published 1947). A first-person account of the *Alsos* spy mission, which proved in 1944 that the Germans were far from producing an atomic weapon.

Holloway, David. *Stalin and the Bomb: The Soviet Union and Atomic Energy 1939-1956*. Yale University Press, 1994. A brilliantly researched account of the Soviet weapons program and its inter-relation with Soviet society.

Ibuse, Masuji. *Black Rain*. Translated by John Bester Kodanska Int. Pub., 1969. A fictional account of survival at Hiroshima.

Lindee, M. Susan. *Suffering Made Real: American Scientists and the Survivors at Hiroshima*. University of Chicago Press, 1994.

Powers, Thomas. *Heisenberg's War: The Secret History of the German Bomb*. A controversial and disputed account claiming that Werner Heisenberg deliberately obstructed the German atomic program for moral conviction.

Quinn, Susan. *Marie Curie: A life*. Simon and Schuster, 1996. A popular biography.

Rhodes, Richard. *Dark Sun: The Making of the Hydrogen Bomb*. Simon and Schuster, 1995. On the H-bomb.

Sherwin, Martin J. *A World Destroyed: The Atomic Bomb And The Grand Alliance*. Vintage, 1977. The best short synopsis of atomic diplomacy. Read this if Alperovits starts to get you down ☺

Sime, Ruth. *Lise Meitner: A Life in Physics*. University of California Press, 1996. A detailed account of Meitner's contributions, what it was like to be a woman physicist in the 1930s, and the effect of Nazism on European science.

Stoff, Michael B. et al., editors, *The Manhattan Project: A Documentary History*. Temple University Press, 1991.

Szilard, Gertrude and Weart, S. *Leo Szilard: His Version Of The Facts*. Transcripts of letters from Einstein and other European émigré physicists.

Walker, Mark. *Nazi Science: Myth, Truth And The German Atomic Bomb*. Da Capo Publishers, 1995. Excellent account of the German bomb project.

Schedule and reading assignments

Tu April 3 Introduction: The atomic age begins in Europe

Reading: Overview by Badash, 1-62.

Th April 5 Atomic science and the search for element number 93.

Atomic science in the 1920s. The problem of element 93.

Reading: Rhodes, *Atomic Bomb*, 13-167.

Tu April 10 Nuclear fission

Hahn, Meitner and Strassman discover nuclear fission. The idea of a bomb emerges. National socialism and fascism drive European scientists to England and the U.S.A.

Reading: Rhodes, *Atomic Bomb*, 168-275.

Th April 12 Physics in America

Nuclear physics in America. The NDRC and the mobilization of science for war.

Reading: Kevles, *The Physicists*, 287-323.

Tu April 17 Physicists propose an atomic bomb

Szilard and Einstein's letter to Roosevelt. The response.

Reading: Rhodes, *Atomic Bomb*, read 279-317, skim 317-357, read 357-394.

Th April 19 The decision to build an atomic bomb

British-American discussions. The organization of the Manhattan Project.

Reading: Rhodes, *Atomic Bomb*, 394-522.

Tu April 24 An atomic industry: Los Alamos, Oak Ridge, and Hanford

The design of the bomb. The production of enriched uranium and plutonium.

Reading: Rhodes, *Atomic Bomb*, 522-614.

Th April 26 Guest Lecture: UCSD Chancellor Emeritus Herbert York

Personal recollections of the Manhattan Project. No additional reading.

Take-home midterm-essay, due in class Thursday May 3

Tu May 1 Guest lecture: Charles Thorpe, Ph.D. candidate.

Robert Oppenheimer as scientist and scientific leader. No additional reading.

Th May 3 Trinity

Video in Class: "The Day after Trinity"

Reading: Rhodes, *Atomic Bomb*, 615-678.

T May 8 Hiroshima and Nagasaki

Reading: Hiroshima Peace Culture Foundation (in reader), "A Bomb: A City tells its Story,"

Rhodes, *Atomic Bomb*, 679-747.

Th May 10 The German bomb project

Why didn't the Nazis also build a bomb? How close did they come? In hindsight, were the emigrés right in their assessment of the situation? Did it matter?

Reading: Walker (in reader), excerpt from *Nazi Science*.

T May 15 Why was the atomic bomb used in Japan?

If the bomb was built to contain the Nazis, why didn't Los Alamos shut down after the German defeat? Why was the bomb used against Japan?

Reading: Alperovitz, *Decision*, Preface-124.

-One-page summary of paper topic, with preliminary references, due Thursday May 17

Th May 17 Atomic diplomacy and the Russian question

After the war, British physicist P.M.S. Blackett declared that the dropping of the bomb was “not so much the last act of the second World War as the first major operation of the cold ...war.” Why?

Reading: Alperovitz, *Decision*, 127-172, 223-248, and 292-371.

Th May 22 An American myth?

The standard story told since 1945 is that the dropping of the bomb was necessary to avoid an invasion of Japan and save millions of American lives. Historian Gar Alperovitz claims this is a myth. If so, who created it? Whom did it serve? How do historians judge historical evidence?

Reading: Alperovitz, *Decision*, 375-497, 501-530, 591-608 and 627-641.

Th May 24 The hydrogen bomb

The Nazis were defeated, the Japanese had surrendered, and scientists could go home. Why did they build the hydrogen bomb?

Reading: Galison and Bernstein (in reader), “In Any Light: Scientists and ...the Superbomb.”

T May 29 Guest Lecture: UCSD Chancellor Emeritus Herbert York

Scientists and the hydrogen bomb. No additional reading.

Th May 31 The cold war and nuclear proliferation

Ultimately, there were tens of thousands of nuclear warheads in the United States and the Soviet Union. How did this happen? By what logic or illogic?

Reading: Badash, *Scientists and Weapons*, 63-114; York (in reader), selection from *Making Weapons, Talking Peace*.

T June 5 Anti-communism and nuclear fear

Video in class: *Fail-Safe*

No additional reading.

Th June 7 The legacies of the atomic age: From nuclear fall-out to nuclear waste

Reading: Hacker (in reader), *Hotter than a \$2 Pistol*, and Makhijani et al. (in reader)

“Nuclear waste...and environmental remediation.”

Term Paper due Monday June 11

Final Exam as scheduled by the University
