ORIGINS OF THE ATOMIC AGE

“We must be curious to learn how such a set of objects--hundreds of power plants, thousands of bombs, tens of thousands of people massed in national establishments--can be traced back to a few people sitting at laboratory benches discussing the peculiar behavior of one type of atom.”

Spencer Weart, *Scientists in Power*, 1979

We must be curious indeed! Despite recent progress toward disarmament, we still exist in a world in which two nations, each possessing thousands of nuclear warheads, have the capacity to destroy all of the planet’s major cities, not to mention much of the territory in between, many times over. At least seven other nations have control of sufficient nuclear explosives to utterly destroy their immediate neighbors. This course explores how this situation came about and how perceptions of nuclear weapons and nuclear energy have changed, with a focus on science and scientists, the role of science in society, and relationships among knowledge, power, and authority. A major theme of the course will be the role played by scientists, first in conceiving and developing atomic weapons and then in attempting to control their use and proliferation. A second recurring theme will be the interactions among scientists, the general public, governments, and regulatory agencies over the uses, limits, and control of scientific knowledge. A third theme concerns the idea that modern science and technology have made warfare between the major states unthinkable and some sort of world government inevitable, as H.G. Wells predicted in 1914.

We will examine, from different perspectives, the decision to use atomic bombs during World War II, the effects and immediate aftermath of the bombing, theories of how nuclear weapons changed perceptions first of World War II and then of warfare in general, the subsequent arms race and various efforts to limit testing and weapons development, strategies of arms control, debates over the safety and regulation of nuclear reactors, and changing views of the biomedical effects and risks of nuclear weapons testing and nuclear power. Our sources will be historical texts, firsthand accounts, fiction, documentary films, feature films, a variety of historical and contemporary articles, and two guest lecturers (Nov. 8 and Dec. 4).

**Course requirements:** (1) regular attendance and participation, (2) short weekly response papers on the readings, (3) three essays, 6-8 pages each.

**Basis for evaluation:** Most of your grade, 80%, will be based on the three formal essays. The other 20% will be based on a combination of factors: attendance (including punctuality), participation, and response papers.

Gene Cittadino
1 Washington Place, Room 412
Tues. & Thurs. 2-4; Weds. 3:30-5:30
(all other times by appointment)
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Texts. The following six required texts are available at the NYU Bookstore. The first five are also on reserve in the Bobst Library; the book by Cirincione is at the bookstore and also available electronically (free), accessible through the Bobst catalog (Bobcat).

Richard Rhodes, *The Making of the Atomic Bomb*
Michael Gordin, *Red Cloud at Dawn: Truman, Stalin, and the End of the Atomic Monopoly*
Don Munton and David Welch, *The Cuban Missile Crisis: A Concise History, 2nd ed.*
Spencer Weart, *The Rise of Nuclear Fear*
Joseph Cirincione, *Bomb Scare: The History and Future of Nuclear Weapons*

There will be occasional supplementary readings either handed out in class or made available on Blackboard.

Rules and requirements:

*Attendance and punctuality.* I pass an attendance sheet around at the beginning of each class. Your commitment to take this course entails a commitment to attend every class and to be on time. If you aren’t in class, I will assume it is due to illness or an unavoidable emergency. Three unexcused absences will be frowned upon; more than three will result in an automatic reduction of your grade. Be respectful of your classmates. Late arrivals always disrupt a classroom. Please discuss it with me if there are circumstances that prevent you from regularly arriving on time.

*Laptops and cell phones.* You may not use your laptop in the classroom, and please turn your cell phone off before coming to class. E-readers may be allowed for course readings only.

*Participation.* The success of this course depends on the quality of the discussions, which, in turn, depends on each student keeping up with the reading and on everyone working to maintain an atmosphere conducive to discussion. For most classes, two students will be assigned to initiate the discussions. On the day(s) you are assigned, you should come to class prepared with one or two questions or comments on the required reading for that day.

*Response papers.* You will be expected to write one response paper on the readings each week. With few exceptions, you will have a choice of bringing in a response paper on Tues. or Thurs. Each should be one typed page (single-spacing is fine), due at the beginning of the class corresponding to the reading. These should be thoughtful reflections on the readings. Feel free to speculate, question, challenge, and probe. Your prose can be looser than for a formal essay, but something more disciplined than free association or an internet blog. At least two response papers should be based on viewing a video related to the readings (see page 4).

*Essays.* There will be three formal essays of from 6 to 8 pages. Topics will be handed out about two weeks before the due dates (Oct. 18, Nov. 20, & Dec. 17). Each essay should have a title and follow formal rules of style, grammar, and documentation. *Late papers.* Response papers and essays must be handed in on the date due. Every late paper has its story, and I’m always willing to listen, but expect late papers to be graded down.

*Documentation and plagiarism:* I will assume that all written work is your own and that you understand the basic rules for acknowledging sources. If you have any questions about this, please ask me and consult the statement on academic integrity on the Gallatin Web site: http://gallatin.nyu.edu/academics/policies/policy/integrity.html
Schedule of Topics and Readings

I. Making the Bomb

SEPT 4  Introduction: The nuclear age, 1945-2012, from Trinity to New Start and beyond

SEPT 6  Flashbacks: 1952, Atomic City; 1983, Barach Obama’s dream of a nuclear-free world
Hogan, “Atomic City, Atomic World” (Blackboard); Broad & Sanger, “The Long Arc of a Nuclear-Free Vision” (handout from first class)

SEPT 11  Radiation and atomic structure: Rhodes, Making of the Atomic Bomb, chaps. 1-3, emphasis on 1 & 2

SEPT 13  Predicting atomic war and world government: H.G. Wells, The World Set Free (1914), excerpts (Blackboard); if time, Neils Bohr, Rhodes, chap. 3

SEPT 18  Scientists and war: Rhodes, chaps. 4-5, emphasis on 4

SEPT 20  Geiger counters, cyclotrons, and the fate of Jewish scientists: Rhodes, chaps. 6-7, emphasis on 7

SEPT 25  Discovering nuclear fission: Rhodes, chaps. 8-9

SEPT 27  Understanding nuclear fission: Rhodes, chaps. 10-11

OCT 2  The Manhattan Project 1: Rhodes, chaps. 12-14; optional--Richard Feynman, “Los Alamos from Below” (Blackboard)

OCT 4  The Manhattan Project 2: Rhodes, 15-16
Video: The Day After Trinity, part I

OCT 9  NO CLASS (extended Columbus Day holiday)

II. Using the Bomb

OCT 11  The Trinity test and beyond: Rhodes, chaps. 17 & 18
Video: The Day After Trinity, part II

OCT 16  Rhodes, chap. 19 & Epilogue

OCT 18  FIRST ESSAY DUE—general discussion on the making and dropping of the bombs

OCT 23  Realities: Hachiya, Hiroshima Diary, Aug. 6-11, 1945, pp. 1-55

Video: Hiroshima-Nagasaki

OCT 30  Hachiya, Aug. 23-Sept. 4, pp. 110-165; Todeschini, “Illegitimate Sufferers” (Blackboard); optional: Beatty, “Genetics in the Atomic Age” (Blackboard)
III. Consequences

NOV 1 Atomic monopoly: Gordin, Red Cloud at Dawn, Introduction and chap. 1

NOV 6 Information, espionage, and the Soviet bomb test: Gordin, pp. 106-132 & chap. 4

NOV 8 Interpreting Joe—Cold War strategies: Gordin, pp. 203-213, chap. 7, & Epilogue
Alex Wellerstein of the American Institute of Physics will be in class to discuss his project on nuclear secrecy

NOV 13 The real thirteen days: Munton & Welch, Cuban Missile Crisis, Intro. & chap. 1

NOV 15 Two minutes to midnight? Munton & Welch, chaps. 2-3
Videos: One Week in October and Voices From the Brink (tentative)

NOV 20 Consequences: Munton & Welch, chap. 4-conclusion
SECOND ESSAY DUE

IV. Nuclear Power, Nuclear Disarmament, Nuclear Fear

NOV 27 The uniqueness and ordinariness of nuclear fear
Weart, The Rise of Nuclear Fear, chaps. 1-7 (selections)
Dwight Eisenhower’s “Atoms for Peace” speech (handout)

NOV 29 MAD, On the Beach, fallout shelters, and ban-the-bomb
Weart, chaps. 8-14 (selections)
Video: excerpt from The China Syndrome

DEC 4 Renewed debates: ABMs, nuclear winter, Nuclear Freeze, nuclear safety
Weart, chaps. 15-21; Spencer Weart will be in class to discuss his book

DEC 6 Post Cold War issues: nuclear power, nuclear terrorism, nuclear proliferation
Weart, chaps. 22-end; begin reading Cirincione, Bomb Scare, Intro. & chaps. 1-3

DEC 11 The present state of the nuclear world: Cirincione, chaps. 4-7

DEC 13 Solutions? (final class)
Cirincione, chap. 8; also J. Peter Scovic, “What Are Nukes Good For?” (handout)

DEC 17 THIRD ESSAY DUE (not a class day)

Films and documentaries for response papers.
There is a vast body of films and documentaries on nuclear war, nuclear disarmament, and nuclear power. We will view a few of these in class, but there is an abundance of material available which we should take advantage of. Therefore, as noted on page 2, for two of your response papers you are required to make use of videos not shown in class. You may make use of these for your essays as well. The choices for viewing are listed on the next two pages. All of these videos are available at the Avery Fisher Center, Bobst Library, second floor.
FILMS/VIDEOS FOR RESPONSE PAPERS
*recommended, **highly recommended

I. Making the Bomb
*Copenhagen, 2002
Television adaptation of Michael Frayn’s play about the 1942 Bohr-Heisenberg meeting

*Doctor Atomic, 2007 (if you are into opera)
Operatic rendition of the days at Los Alamos leading to the Trinity test

Fat Man and Little Boy, 1979
Hollywood dramatization of the Manhattan Project

Secret City: The Oak Ridge Story, 2005
Documentary on Oak Ridge contribution to Manhattan Project, based on interviews

II. Using the Bomb

Hiroshima: Why the Bomb Was Dropped, 2002
ABC News documentary, Peter Jennings

Let Me Count the Ways: Minus 10, Minus 9, Minus 8, Minus 7, 2004
Documentary by daughter of World War II pilot sent to Hiroshima

Enola Gay, 2005
Documentary on the plane that dropped the first bomb and the decision

To Die, To Live: The Survivors of Hiroshima, 1975
Survivors reflect on their lives and lives of those who perished

No More Hiroshima, 1984
Focus on effects of bombing on survivors

Hiroshima no pika, 1986
Animated film based on Japanese children’s book

**Black Rain, 1991
Gripping Japanese feature film on Hiroshima bombing and aftermath

Our Hiroshima, 1997
Peace advocate reflects on the bombing that killed most of her family

III. Nuclear Power (also effects of radiation from bomb tests)

Clouds of Doubt, 1979
Scientists question safety of Nevada Bomb tests in 1950s

The China Syndrome, 1979
Feature film that explored nuclear reactor safety and just preceded Three Mile Island

Dark Circle, 1982
Follows trail of plutonium from weapons facility to power plant in West

Silkwood, 1983
Feature film about mysterious death of nuclear plant employee

*Radio Bikini, 1989
Effects of radiation on sailors at Bikini Islands bomb tests

Children of Chernobyl, 1992
Devastating effects of the 1986 nuclear reactor disaster in the Ukraine

Death on the Silk Road, 1998
Cancer and birth defects as results of China’s nuclear tests

IV. Arms Race and Resistance

Cold War feature films:
*The Day the Earth Stood Still, 1951
Aliens threaten to destroy Earth if humans do not put an end to war

*Them! 1954
Nuclear tests create giant ants in the Southwest

*Gojiri (Godzilla), 1954
Monster awakened from beneath the sea by nuclear tests
**On the Beach**, 1959
Survivors of nuclear war await their fate in Australia as radiation clouds approach

**Hiroshima, mon amour**, 1959
French actress & Japanese architect fall in love and share wartime experiences

**Dr. Strangelove**, 1963
Paranoid general precipitates nuclear Armageddon

**Fail-Safe**, 1964
Technical glitch puts world on brink of nuclear holocaust

*The Day After*, 1983
Reagan-era made-for-TV movie about the unthinkable: all-out nuclear war

*War Games*, 1983
A young Matthew Broderick nearly starts nuclear war playing computer game

*Threads*, 1984
Fictional account of effects of nuclear war set in English city of Sheffield

**Nuclear espionage:**

*The House on 92nd Street*, 1945
Feature film: German-American asked to send bomb secrets to Nazis

*Secrets, Lies, and Atomic Spies*, 2002
Recent look at extensive Soviet spy network in 1940s

*Stealing the Fire*, 2002
Atomic espionage from Nazi Germany to Saddam Hussein’s Iraq

**Vintage Cold War documentaries:**

**Atomic Cafe**, 1982
Compilation of film clips from Alamagordo to Civil Defense films

*Target You!*, 1950s and ‘60s educational films on Civil Defense, the bomb, etc.

*Atomic Scare Films, Vol. I*
Various government films on Civil Defense

**The Cuban missile crisis:**

*The Missiles of October*, 1974
Dramatic reenactment of events of October 1962

*One Week in October*, 1985
Short documentary (29 min.)

*Thirteen Days in October*, 2000
Longer documentary (90 min.)

*Thirteen Days*, 2000
Feature film, Kevin Costner, et al.

**Nuclear disarmament documentaries:**

*Collective Disarmament*, 1982
Samples from 1982 poll on disarmament

*In the King of Prussia*, 1982
Reenactment of the trial of nuclear weapons protestors

*A Meeting With the Enemy*, 1983
Referendum on nuclear disarmament and its aftermath

*What About the Russians*, 1983
Balancing fear and trust in calling for disarmament

*The Edge of History*, 1984
Stanford Symposium on the Prevention of Nuclear War

*How to Prevent a Nuclear War*, 1987
Various individuals, knowledgeable and otherwise, speak their minds

*Building Bombs*, 1991
Documents the dilemmas of bomb plant workers

*Roaring Across the Horizon*, 2004--China’s race to develop the bomb