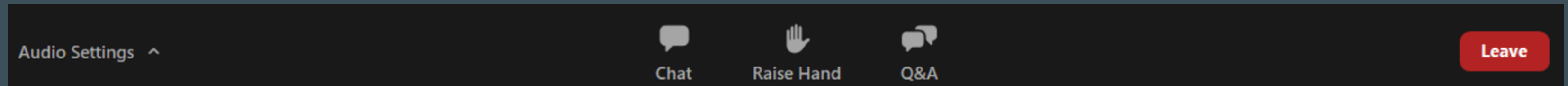






# How to Participate



- If you would like to ask a question, you can use the Q&A feature.
- We will be answering audience questions throughout the session.
- The views expressed here are those of the historian.

## For Security and Privacy

- Your microphone is automatically muted.
- Your camera is automatically turned off.

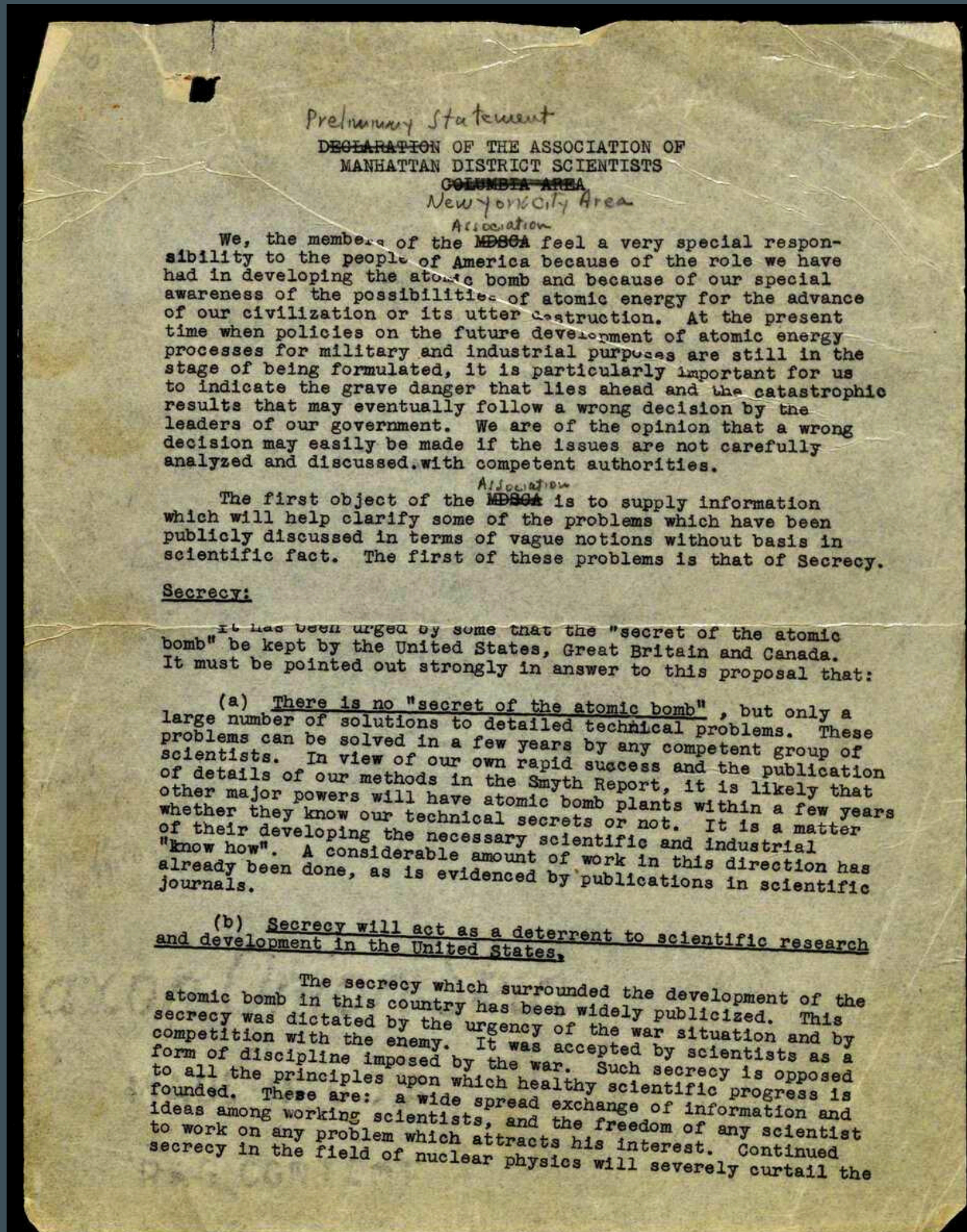




# Today's Document



Preliminary Statement of the Association of Manhattan  
District Scientists, by Irving Kaplan et al., ca. August 1945.  
(Gilder Lehrman Institute, GLC03152.02)





# Cynthia Kelly



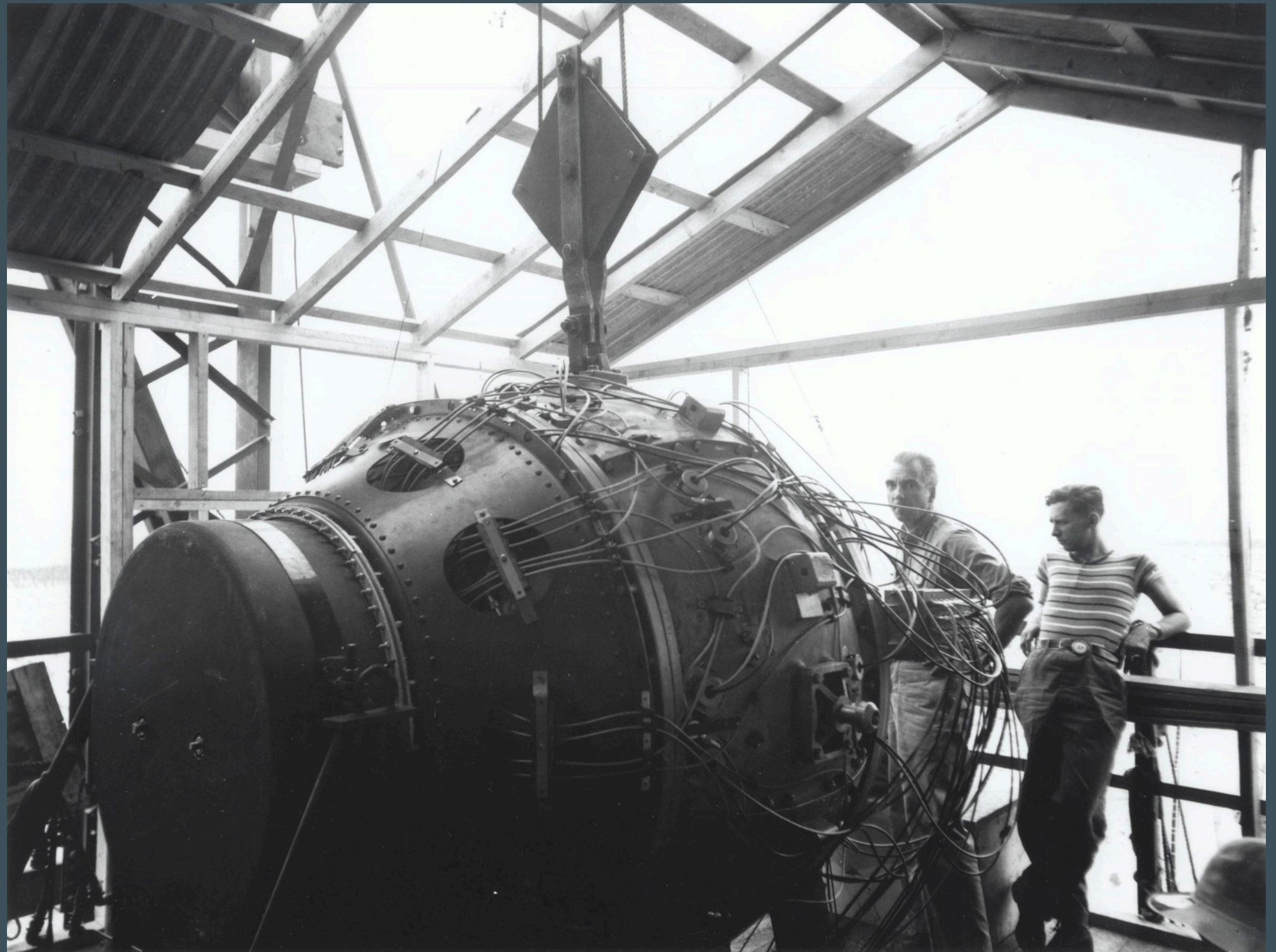
Cynthia Kelly is the founder and president of the Atomic Heritage Foundation, an organization dedicated to preserving and interpreting the history and legacy of the Manhattan Project and the Atomic Age. Before creating the Foundation, she served over two decades as a senior executive at the US Department of Energy and the Environmental Protection Agency where she received a Distinguished Career Service Award. She has written several books, including *The Manhattan Project: The Birth of the Atomic Bomb in the Words of Its Creators, Eyewitnesses, and Historians* and *Remembering the Manhattan Project*. She has spoken widely on the topic with numerous appearances on C-SPAN. Before entering public service, she earned her bachelor's degree in History from Wellesley College and a master's from Yale University.



# What was the Manhattan Project?



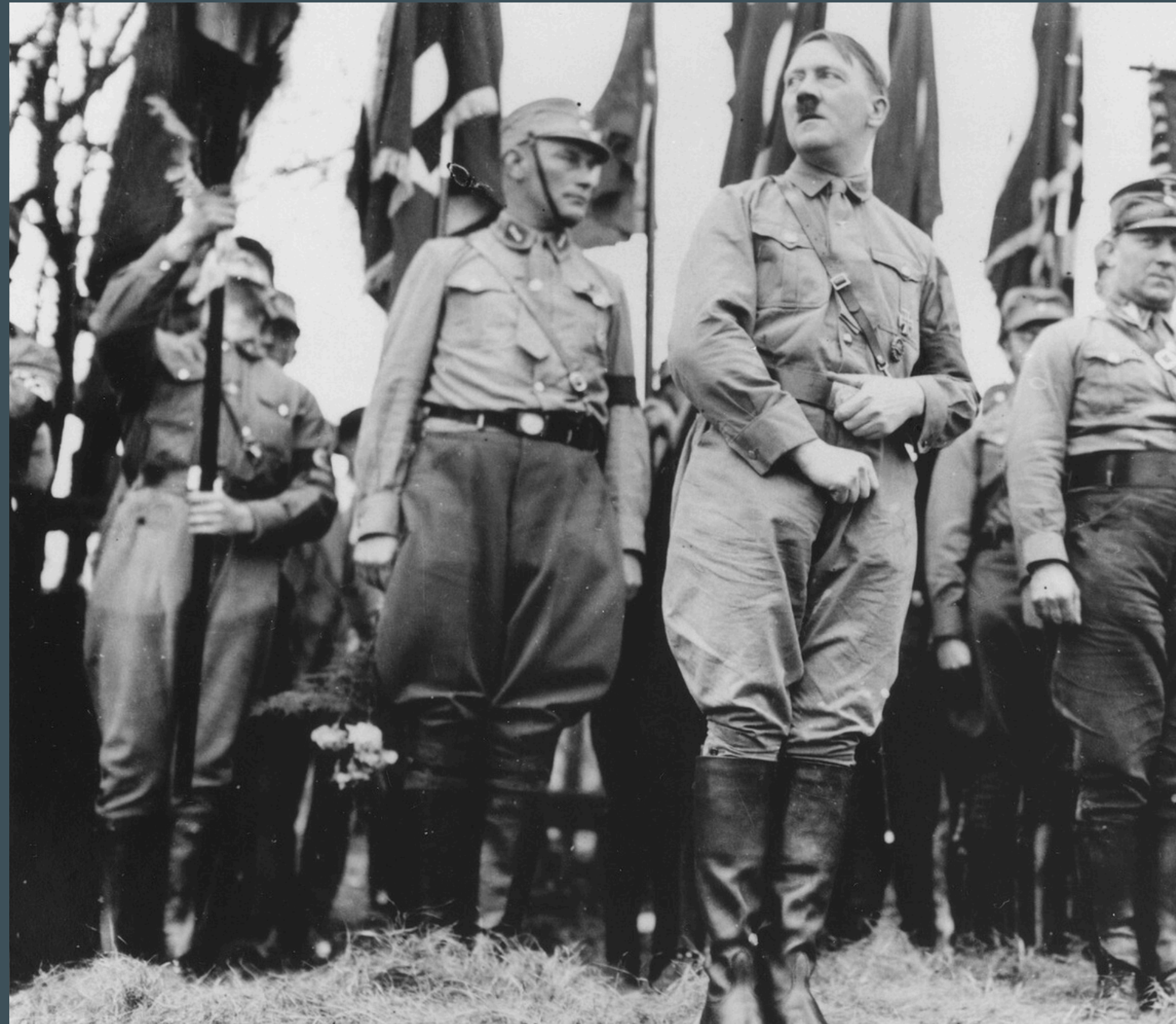
J. Robert Oppenheimer and Leslie Groves at “Ground Zero,”  
September 1945. (US Department of Energy Archives)



Norris Bradbury with the Trinity Device. (US Department of Energy Archives)



# The Perfect Storm: Scientific Discovery and Global Crisis



Adolf Hitler leads an SA unit in a Nazi party parade in Weimar, 1931. (United States Holocaust Memorial Museum, courtesy of James Sanders)

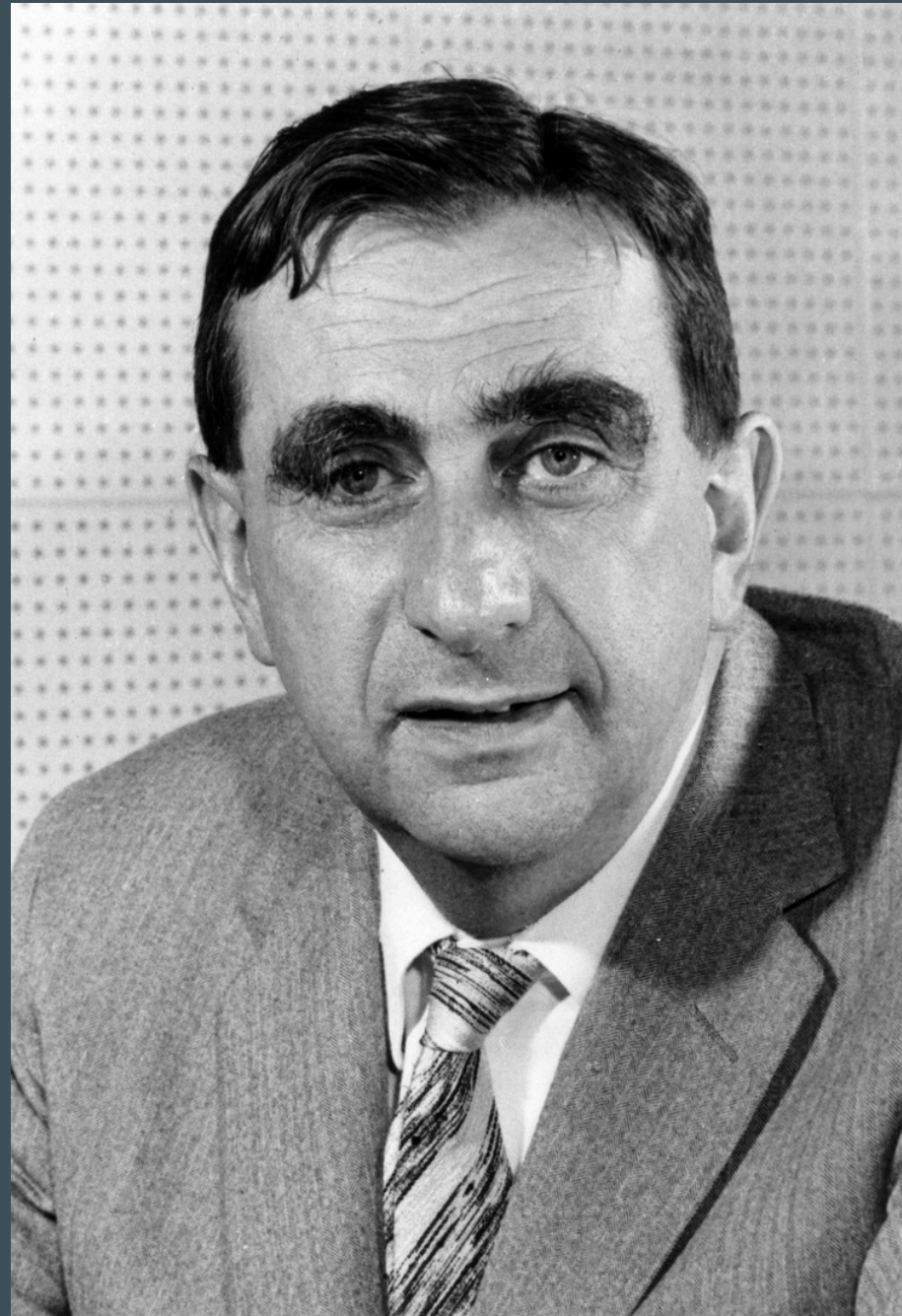


# 1933: Hitler Condemns “Jewish Physics” Forcing Jewish Scientists to Flee



Hans Bethe, ca. 1930.

(Hans Bethe Papers, #14-22-976. Division of  
Rare and Manuscript Collections, Cornell  
University Library)



Edward Teller, ca. 1958.

(Lawrence Berkeley National Laboratory,  
courtesy AIP Emilio Segré Visual Archives)



Leo Szilard, August 15, 1957.

(University of Chicago Library, Special  
Collections Research Center)



# December 1938: Germans Accidentally Bombard Uranium



Lise Meitner and Otto Hahn working with equipment in their laboratory, 1913. (Archives of the Max Planck Society, courtesy of AIP Emilio Segré Visual Archives)





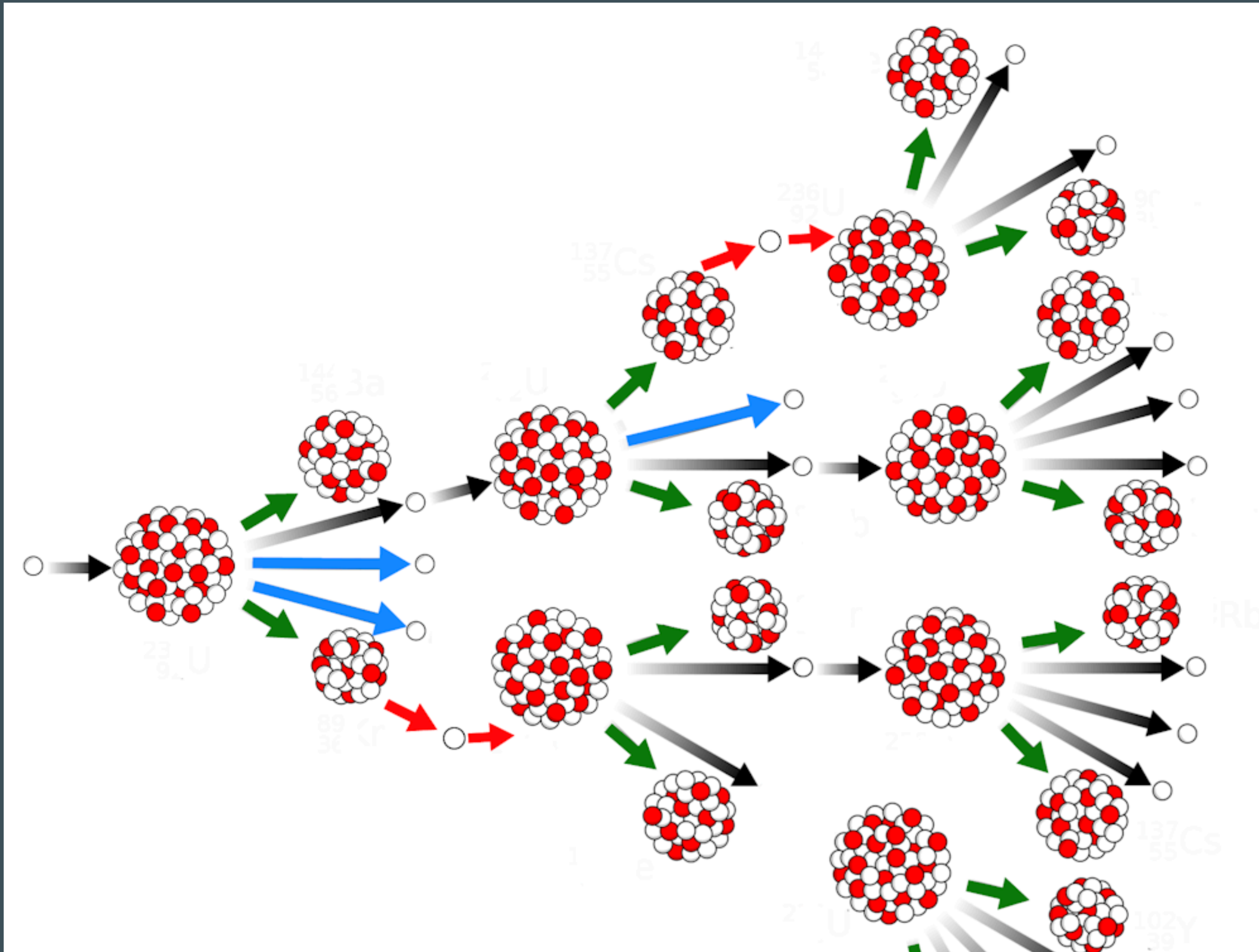
# Meitner Recognizes “Fission” while in Exile



“What’s going on, Lise?” drawn by Christian Lindemann, 2014. (Environment & Society Portal, Multimedia Library)



# Nuclear Chain Reaction Possible with Uranium





# International Race for an Atomic Bomb

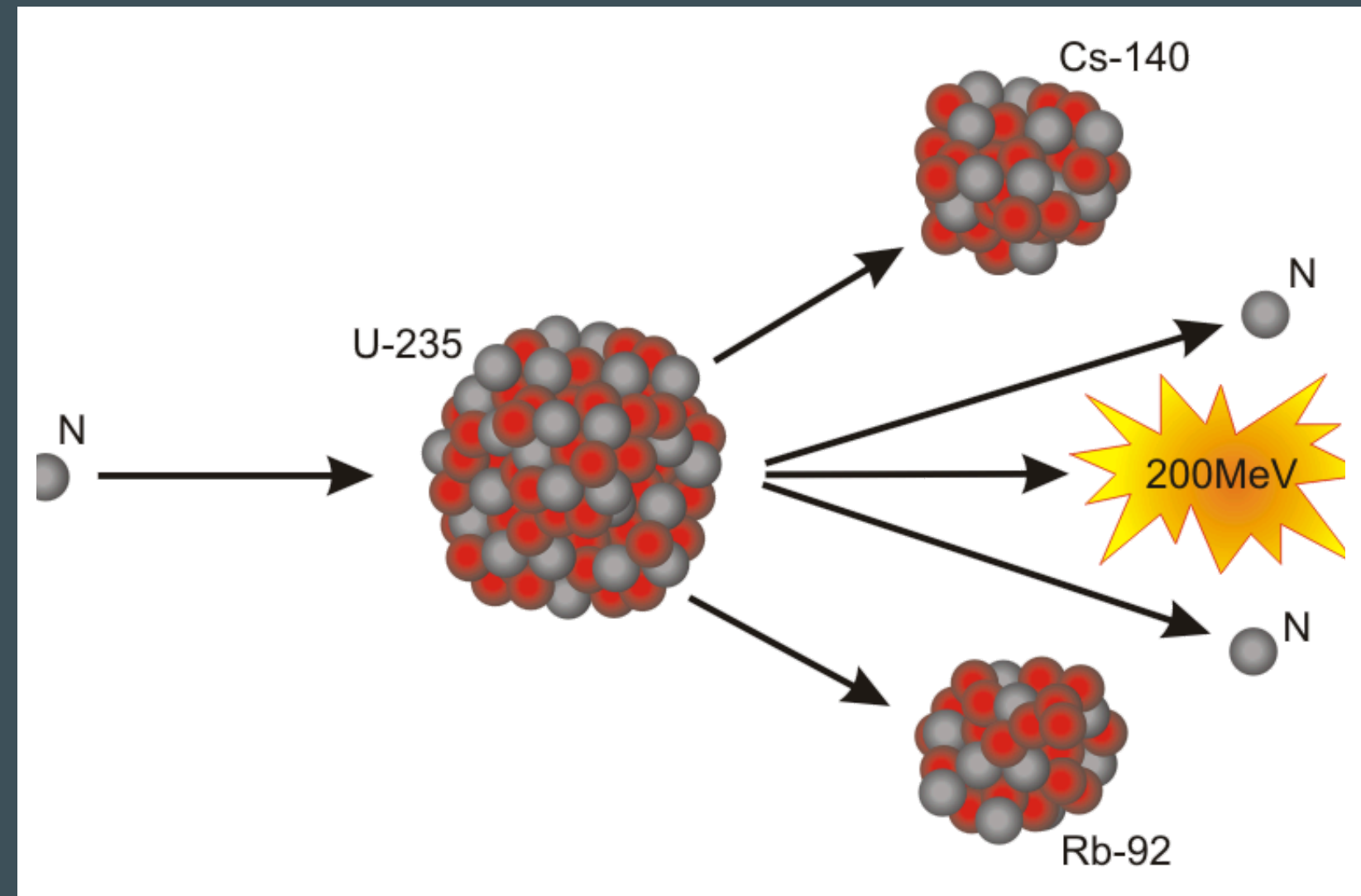
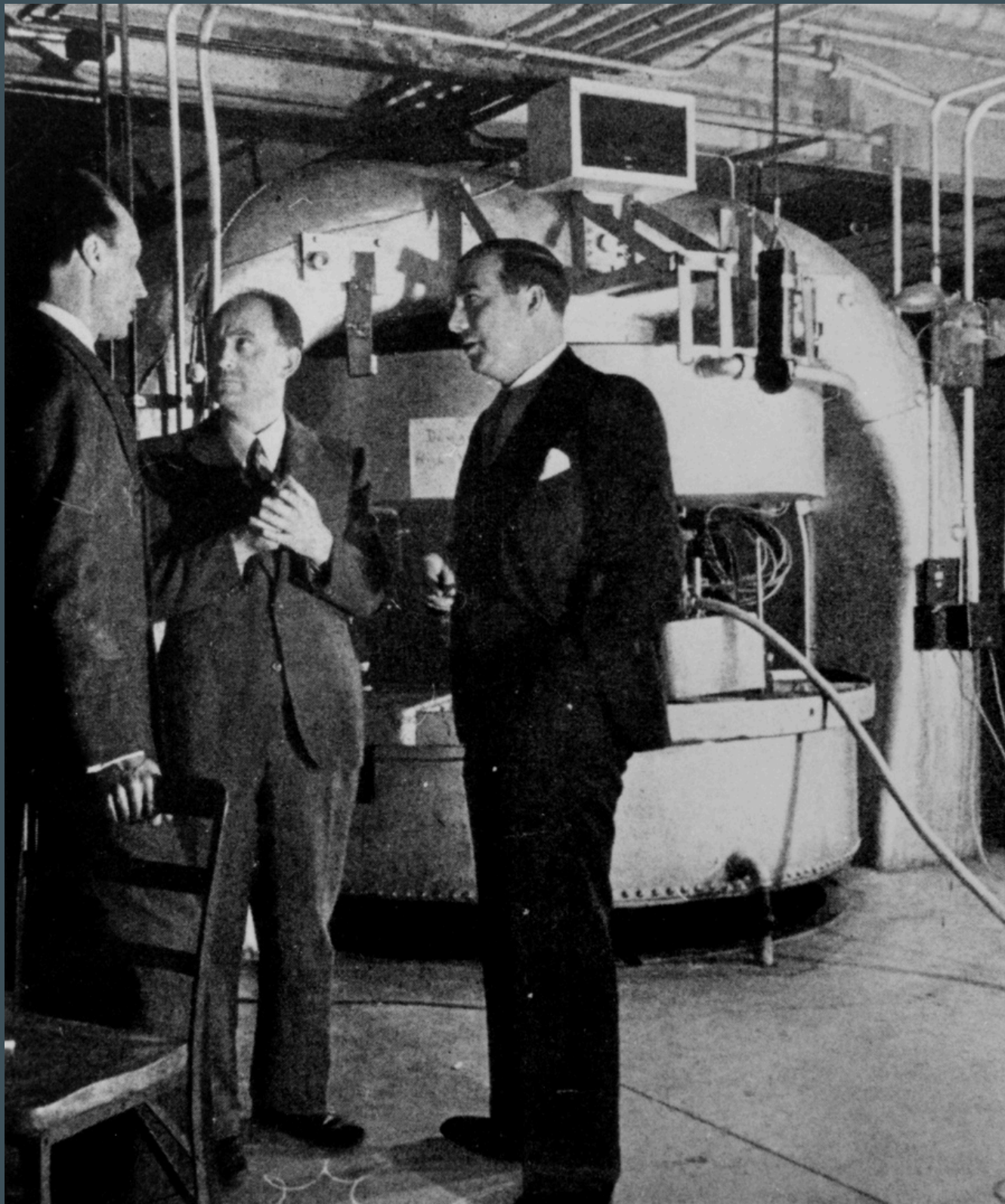


The World in 1938, NSassin, November 2, 2014. (Wikimedia Commons CC BY- SA 4.0)



# January 1939: Cyclotron Splits U-235

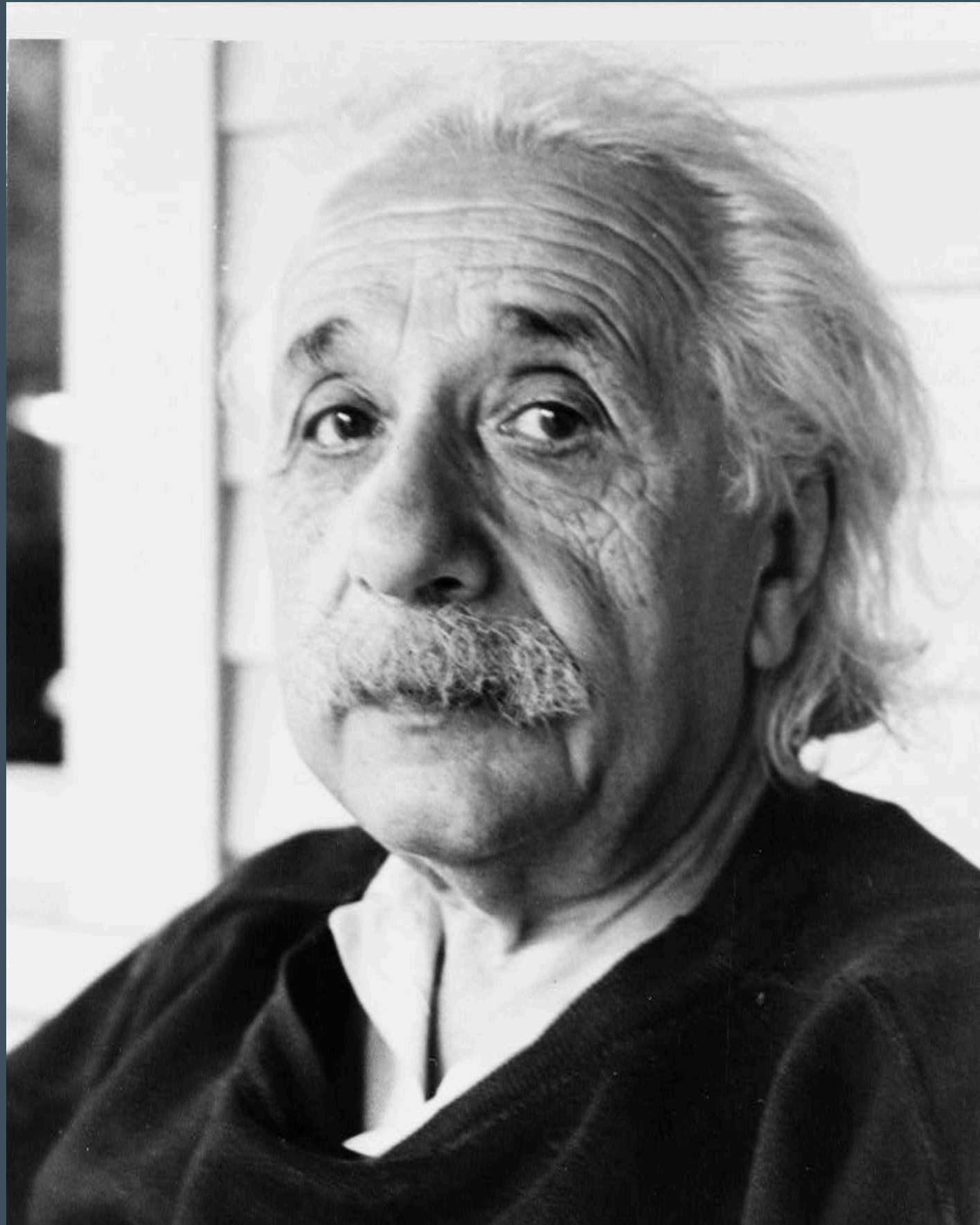
Can you control a nuclear reaction?  
Can you harness atomic energy for war  
and/or peaceful uses?



Left to Right: Dana P. Mitchell, Enrico Fermi, and John Dunning,  
ca. 1940. (Photo by Warman, Columbia University, courtesy AIP  
Emilio Segré Visual Archives)



# Einstein's Letter to President Roosevelt



“That it may become possible to set up a nuclear reaction in a large mass of uranium...this new phenomenon would also lead to the construction of bombs, and it is conceivable that extremely powerful bombs of a new type may be constructed.”

– Letter from Albert Einstein to President Franklin Roosevelt, August 2, 1939. (Franklin D. Roosevelt Presidential Library and Museum)

Albert Einstein, by John D. Schiff, ca. 1945.  
(Library of Congress)



# President FDR Approves an Advisory Committee on Uranium



“Alex, what you are after is to see that the Nazis don’t blow us up?”

– FDR to Alexander Sachs, an economist at Lehman Brothers and a friend.

Robert Jungk, *Brighter Than a Thousand Suns: The Story of the Men Who Made the Bomb*, New York: Grove Press, 1958, p. 111. (Internet Archive)

Franklin Delano Roosevelt, by Elias Goldensky,  
December 27, 1933. (Library of Congress)



# Army Corps of Engineers Creates the Manhattan Engineer District



- 270 Broadway in Manhattan
- Where the Manhattan Project was initiated
- Created August 13, 1942



Tower 270, located at 270 Broadway in lower Manhattan.  
(Courtesy of Cynthia Kelly)



# General Leslie R. Groves



“If I can’t do the job, no one man can.”

- Decisive and confident
- Secrecy was a top priority
- Clashed with scientists
- Groves & Oppenheimer: an extraordinary pair



Lieutenant General Leslie R. Groves, USA, Connecticut. (National Archives)

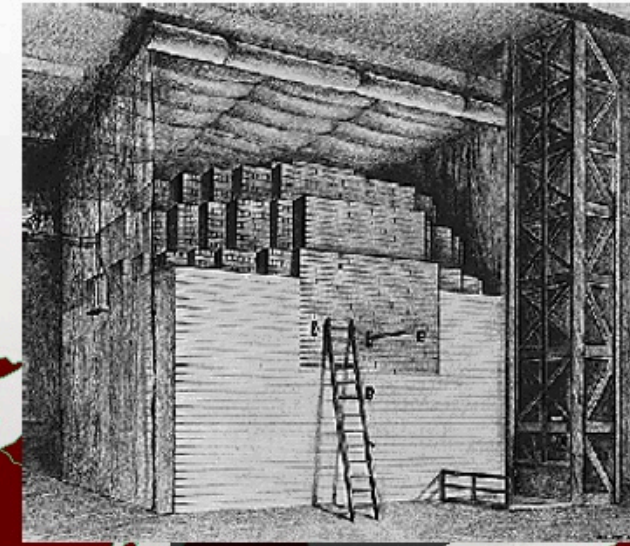


# Where It Happened

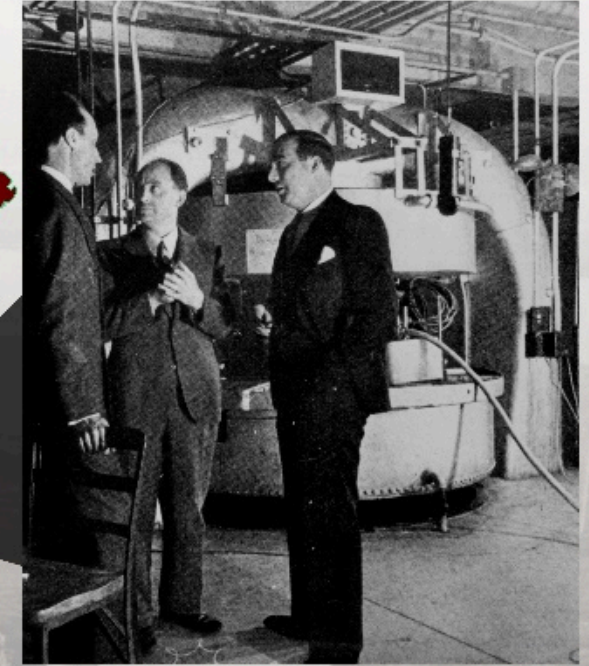


**Hanford, WA**  
Plutonium production

**Chicago, IL**  
Metallurgical Laboratory  
Research led by Enrico Fermi



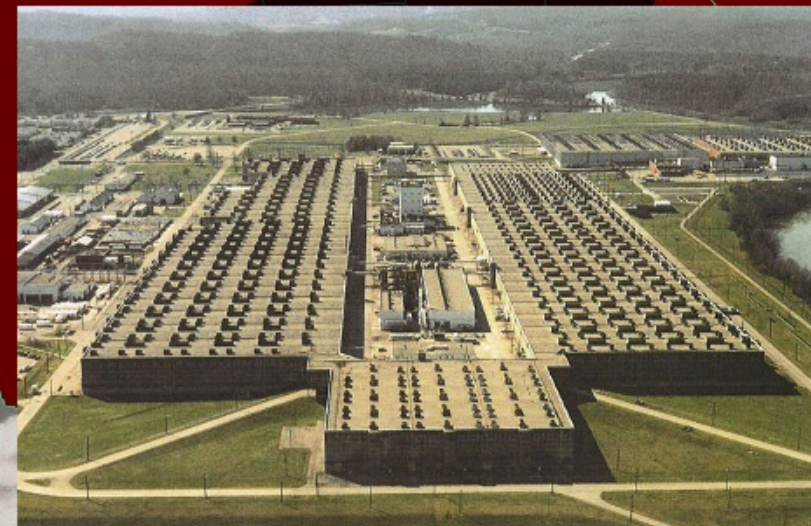
**New York, NY**  
Original headquarters; Uranium enrichment research



**Berkeley, CA**  
Radiation Laboratory  
Directed by Ernest O. Lawrence



**Los Alamos, NM**  
Bomb design & testing



**Oak Ridge, TN**  
Uranium enrichment



**Washington, DC**  
General Groves' office

***"It can never be done unless you turn the United States into one huge factory."***

**-Niels Bohr**



# Columbia University's Substitute Alloy Materials Laboratory (SAM)

1942–1945: Led Manhattan Project research at SAM, but uncomfortable with the military

1945: Actively opposed the Atomic Energy Act of 1945; “totalitarian”

Postwar: Against development of the Hydrogen bomb

“Harold Urey, scientist, dies at 87; War Foe’s Work Led to H-Bomb,” Malcolm W. Browne, January 1981. (Gilder Lehrman Institute, GLC03152.08)

## Harold Urey, Scientist, Dies at 87; War Foe’s Work Led to H-Bomb

By MALCOLM W. BROWNE

Harold C. Urey, a life-long critic of military force whose discovery of heavy hydrogen opened the possibility of thermonuclear warfare, died Monday night at his home in La Jolla, Calif.

Dr. Urey, who won the 1934 Nobel Prize in chemistry for his discovery, died at the age of 87, apparently of a heart attack. He had suffered progressive symptoms of Parkinson’s disease and cardiac disease in the last decade.

While Dr. Urey’s scientific prestige rested on his discovery in 1931 of the heavy form (or isotope) of hydrogen, called deuterium, he made major contributions to space exploration and to scientific explanations for the evolution of the universe and the origin of life.

### Lightning and Protein

In 1953, Dr. Urey and a graduate student, Stanley L. Miller, carried out a landmark experiment demonstrating that earth’s primordial ingredients could have been forced by lightning discharges to combine into some of the basic chemicals of life.

In the Urey-Miller experiment, electric sparks were passed through a heated mixture of methane, ammonia, hydrogen and water, with the resulting formation of four amino acids — the building blocks of protein.

“Urey was always goading and provoking us to do things like that,” a former student reminisced. “He told me once: ‘There are a lot of people around who are smarter than me. But I pick only the most important problems.’”

Colleagues consider that Dr. Urey founded modern lunar science with his



Associated Press

Dr. Harold C. Urey

speculations and deductions about the moon’s geology.

One of his former students, Dr. Gerald Wasserburg of the moon rock laboratory of the California Institute of Technology, said yesterday, “Harold had always had a love affair with the moon.”

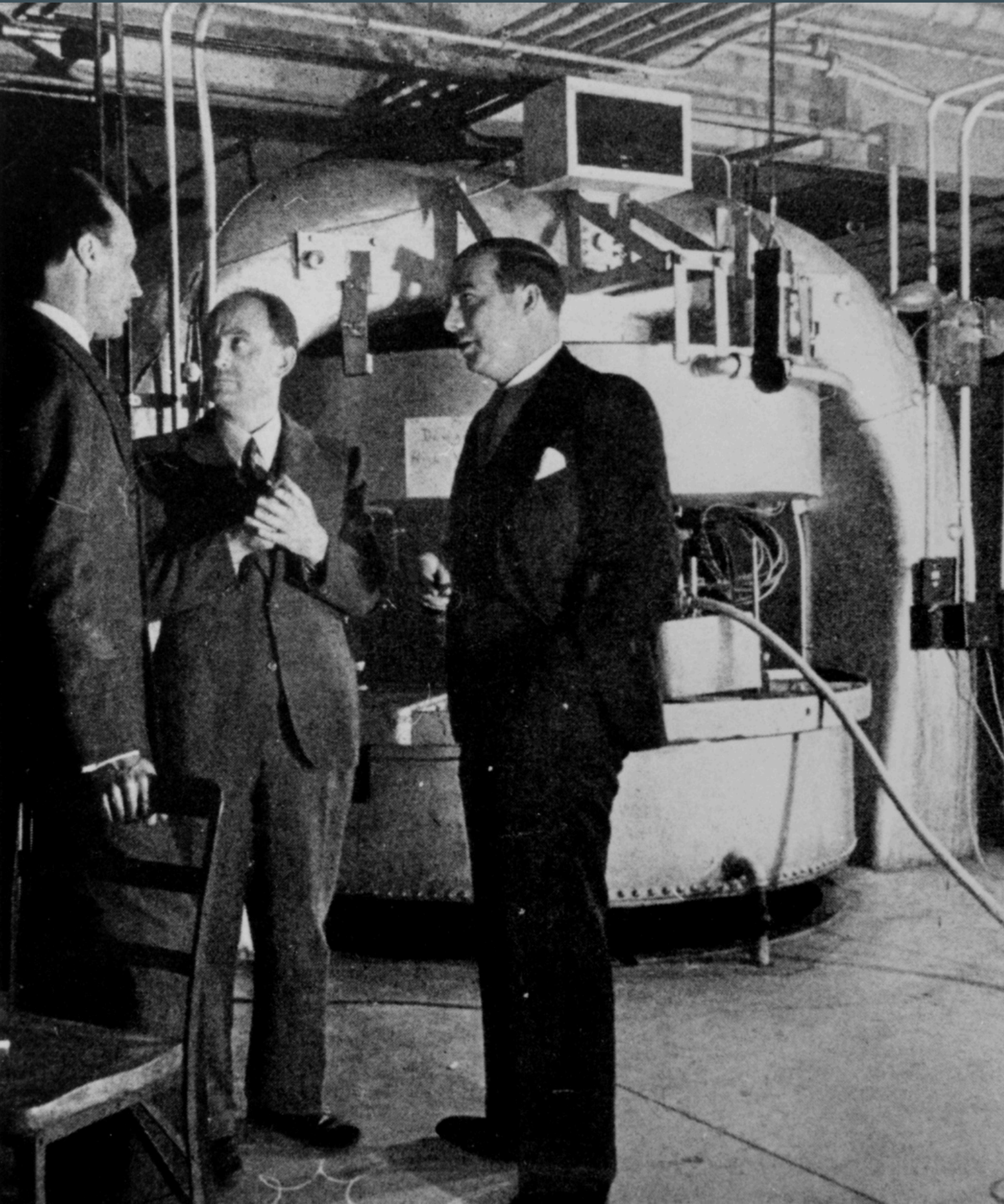
Dr. Urey wrote in 1961: “The space

Continued on Page B12, Column 3

TO BETTI: THE FIRST 20 ARE THE HARDEST! CONGRATULATIONS AND LOVE—BOB—ADVT.



# John Dunning



Director of Division I: Gaseous Diffusion  
Substitute Alloy Materials (SAM)

1935–1936: Met leading physicists of Britain,  
Germany, France, Denmark, and Italy

1936: Built Columbia's first cyclotron for nuclear  
experiments

1939: Cyclotron splits U-235: proof of “fission”

1941–1945: Led uranium isotope separation efforts

Left to Right: Dana P. Mitchell, Enrico Fermi, and John Dunning, ca. 1940. (Photo by  
Warman, Columbia University, courtesy AIP Emilio Segré Visual Archives)



# Manhattan Project Scientists



## Substitute Alloy Materials (SAM) Laboratory 1945

Left to Right: Irving Kaplan, Francis Bonner, unknown,  
Robert E. Harrison

Photograph of scientists involved with the Manhattan Project, s  
ca. 1945. (Gilder Lehrman Institute, GLC03152.09)





# Nash Auto Showroom

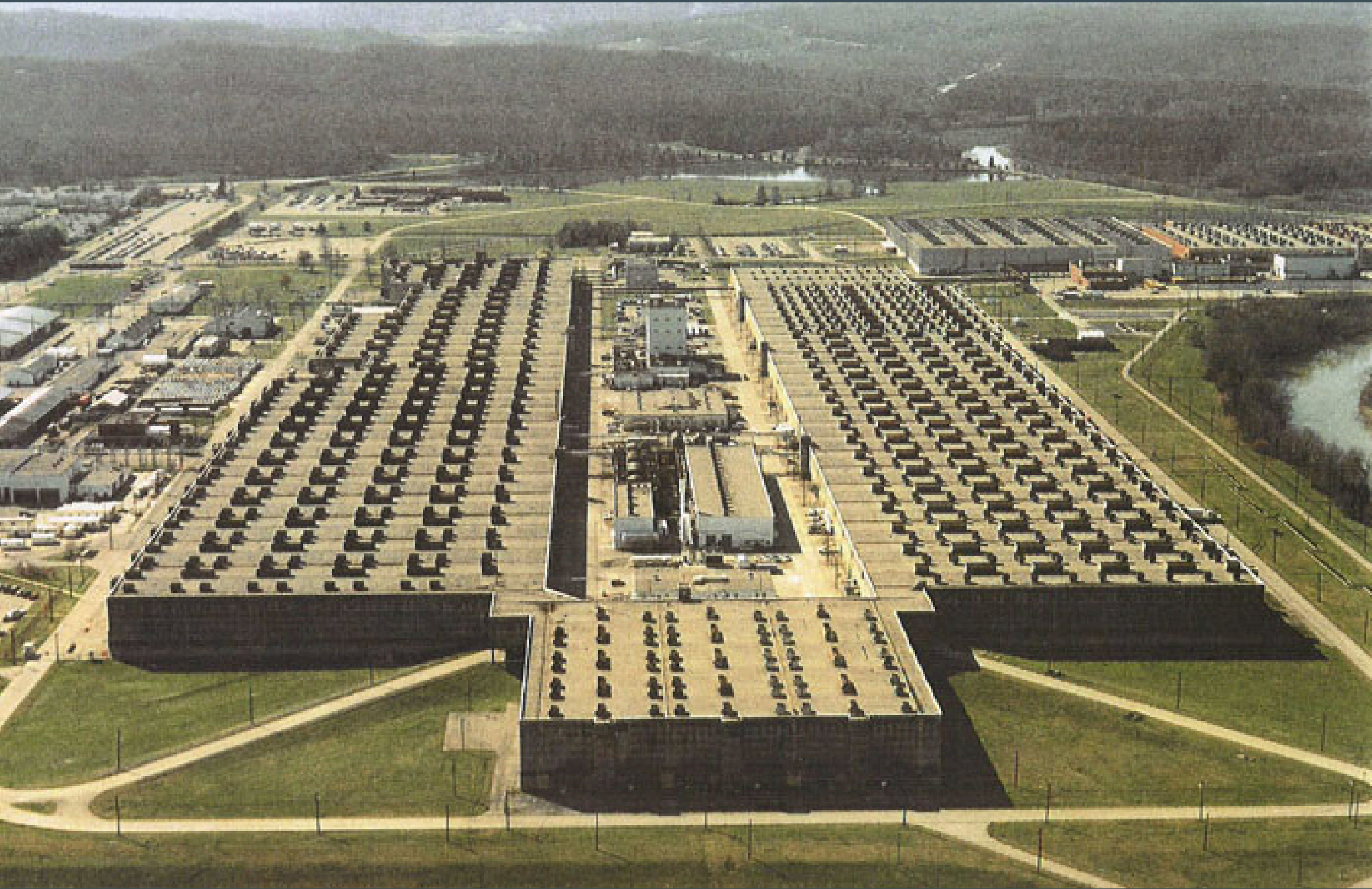


- 137th Street & Broadway in Manhattan
- Virtually identical uranium isotopes: U-235 (fissile) and U-238 (stable)
- Enormous technical challenges
- Barrier with microscopic holes
- Leapt from lab to full-scale facility

Nash Garage Building, “Voices of the Manhattan Project.” (Atomic Heritage Foundation)



# K-25 Plant in Oak Ridge, TN



- Mile-long, U-shaped building
- Cascade of 3,000 repetitive units
- Uranium gas highly corrosive
- Moisture & air cause violent reactions
- Enriched uranium for WWII and for fuel through the Cold War

K-25 History Center. (Atomic Heritage Foundation)

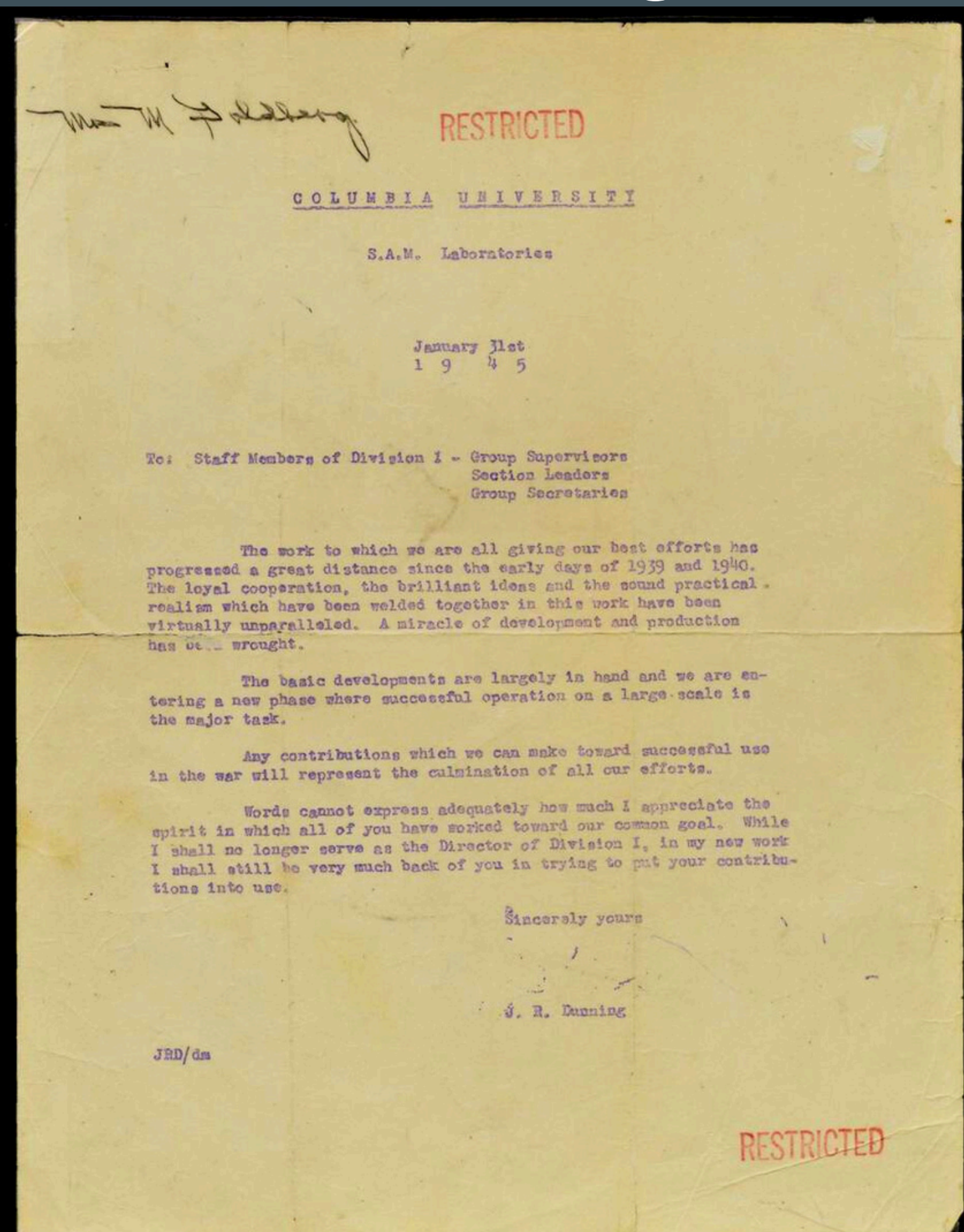


# John Dunning's Farewell, January 1945



“A miracle of development and production.”

- Recognizes his team's loyal cooperation, brilliant ideas, and practical realism
- Dunning had “an ‘uncanny feel’ for the practical solution to an engineering problem.” – NY Times Obituary, August 28, 1975
- Dean, Columbia School of Engineering (1950–1969)
- Consulted with President Eisenhower and Adm. Hyman Rickover on nuclear issues



Resignation Letter from John Dunning to staff members of Columbia University, S.A.M., Laboratories, Division 1, January 31, 1945. (Gilder Lehrman Institute, GLC03152.07)



# Preliminary Statement of the Association of Manhattan District Scientists



“The SECRET stamp is the most powerful weapon ever invented.” –Leo Szilard

- Irving Kaplan, Francis Bonner, and others
- Special responsibility to the US public
- “No secret of the atomic bomb”
- Secrecy deters research & development
- Secrecy will lead to nuclear arms race

*Preliminary Statement*  
DECLARATION OF THE ASSOCIATION OF  
MANHATTAN DISTRICT SCIENTISTS  
~~COLUMBIA AREA~~  
*New York City Area*  
*Association*

We, the members of the ~~MDSCA~~ *Association* feel a very special responsibility to the people of America because of the role we have had in developing the atomic bomb and because of our special awareness of the possibilities of atomic energy for the advance of our civilization or its utter destruction. At the present time when policies on the future development of atomic energy processes for military and industrial purposes are still in the stage of being formulated, it is particularly important for us to indicate the grave danger that lies ahead and the catastrophic results that may eventually follow a wrong decision by the leaders of our government. We are of the opinion that a wrong decision may easily be made if the issues are not carefully analyzed and discussed with competent authorities.

The first object of the ~~MDSCA~~ *Association* is to supply information which will help clarify some of the problems which have been publicly discussed in terms of vague notions without basis in scientific fact. The first of these problems is that of Secrecy.

Secrecy:

It has been urged by some that the "secret of the atomic bomb" be kept by the United States, Great Britain and Canada. It must be pointed out strongly in answer to this proposal that:

(a) There is no "secret of the atomic bomb", but only a large number of solutions to detailed technical problems. These problems can be solved in a few years by any competent group of scientists. In view of our own rapid success and the publication of details of our methods in the Smyth Report, it is likely that other major powers will have atomic bomb plants within a few years whether they know our technical secrets or not. It is a matter of their developing the necessary scientific and industrial "know how". A considerable amount of work in this direction has already been done, as is evidenced by publications in scientific journals.

(b) Secrecy will act as a deterrent to scientific research and development in the United States.

The secrecy which surrounded the development of the atomic bomb in this country has been widely publicized. This secrecy was dictated by the urgency of the war situation and by competition with the enemy. It was accepted by scientists as a form of discipline imposed by the war. Such secrecy is opposed to all the principles upon which healthy scientific progress is founded. These are: a wide spread exchange of information and ideas among working scientists, and the freedom of any scientist to work on any problem which attracts his interest. Continued secrecy in the field of nuclear physics will severely curtail the

Preliminary Statement of the Association of Manhattan District Scientists, ca. August 1945.  
(Gilder Lehrman Institute, GLC03152.02)



# Preliminary Statement of the Association of Manhattan District Scientists



“Future bombs will have vastly greater destructive possibilities.”

- Hiroshima: one crude, pioneering bomb
- Future bombs will be far more powerful
- Hard to prevent attacks or retaliate
- Decentralize cities, industrial areas
- Preventative conquest unthinkable
- Nuclear armed world: “a grave hazard”

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Preliminary Statement of the Association of Manhattan District Scientists, ca. August 1945.  
(Gilder Lehrman Institute, GLC03152.02)



# Preliminary Statement on Legislation for Future Development of Atomic Energy



Andrew Jackson May, January 28, 1947.  
(Collection of the US House of  
Representatives)

- Opposes Atomic Energy Act of 1945 (May-Johnson Bill)
- Secrecy provisions too broad, draconian penalties
- Commission composition, terms unspecified
- Administrator too powerful, likely military control



Senator Edwin Johnson, U.S. Senate  
Historical Office. (USFWS National  
Digital Library)



# Preliminary Statement on Legislation by Irving Kaplan, August 1945

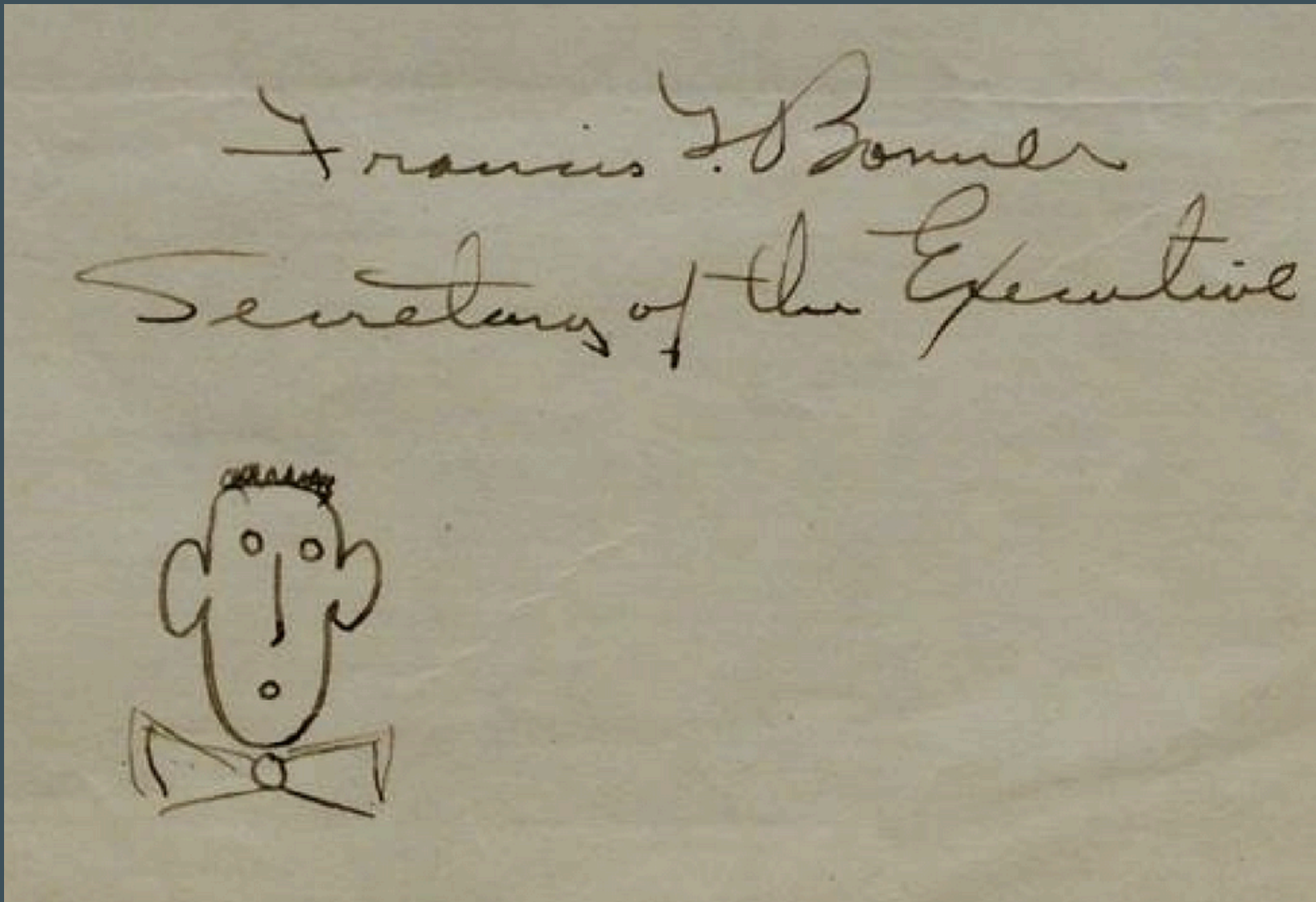
- Interim US control of military atomic energy matters pending international control
- US government control of industrial atomic energy applications
- Civilian control of the AEC
- Maximum freedom for scientific research
- Scientists determine what amounts of fissile material threaten national security
- Ideas reflected in McMahon Bill (Dec. 1945)

“Senator Brien McMahon, Statesman from Connecticut,”  
Kotzky & Fox, ca. 1946. (Certified Collectibles Group Comics)





# Draft of Newsletter, November 1945



Bonner's notes related to a recent meeting of the Association of Manhattan Project Scientists in the New York City area, Francis Bonner, ca. November 1, 1945. (Gilder Lehrman Institute, GLC03152.06)

- Francis Bonner, Secretary of Executive Committee
- Clark Eichelberger, director of the American Association for the UN, promoted international control
- Small commission of scientists to investigate feasibility
- Meeting of delegates from Oak Ridge, Chicago, NYC, and Los Alamos
- Changed name to Manhattan Project Scientists
- Dues: \$1 per year per \$100 earned



# Recollections of Mildred Goldberg



GLC03152  
Personal Recollections of Mildred Goldberg, Secretary to the  
Theoretical Group, SAM Laboratories, The Manhattan Project;  
1943 - 1946 -1-

In March of 1943 I returned to N.Y. from Camp Lee, Va. where I had lived with my husband of three months. He had been sent overseas and I started a new job with the U.S. Engineers then located at 120 Wall Street. I was a file clerk, rephotographing and filing bills of lading and statements of account. Not too long thereafter that particular division was dispersed and one of my colleagues suggested that I apply to Columbia U. Engineering school where his brother-in-law was the procurement agent (having perceived my colleague to be a bit of a lecher, I wondered just what commodity his brother-in-law was procuring). Nevertheless I applied and was sent to be interviewed by a Dr. Willard F. Libby. His office was nothing like what I conceived a doctor's office to be - no examining table, no stethoscope dangling impressively down the white coat front, no avuncular manner. In fact, I was so ignorant that it took several weeks before I learned that the Dr. title indicated a P.H.D., a degree which in those days was hardly and rarely achieved.

Here, too, my days were routine. I filed masses of material (none of which I understood) under the supervision of an aged, irascible, virago who had no tolerance for a starry-eyed newly wed not too long removed from the east side ghetto. She made me so miserable that I tendered my "resignation" and was told that I had a war priority job which was frozen for the duration. Instead, I was transferred to the Nash Building on 137th St. and B'way. This had been a Nash automobile showroom. It was a huge space with stairs and elevators leading to its six levels, and additional steep ramps leading to each floor as well. It was a particularly well suited place for the heavy machinery that was constantly being received and moved about.

There were scattered cubicles on each level which had formerly been used by salesmen but were now used as offices for the group heads. The particular titles of these groups were never spelled out to me, but I deduced that they were broken down into physics, math, chemistry, engineering, and possibly others too esoteric for my very limited understanding.

- At 20, “war widow”; husband was shipped overseas
- Secretary for Harold Urey, John Dunning, Irving Kaplan, and others
- No formal training, but enjoyed the “charmingly eccentric” group
- Only learned about the bomb after Hiroshima
- Account “vindicates these men’s efforts...to save and not to destroy our civilization.”

Personal recollections of Mildred Goldberg, secretary to the theoretical group, SAM Laboratories, The Manhattan Project; 1943–1946, Mildred Goldberg, ca. October 1945. (Gilder Lehrman Institute, GLC03152.01)



# 80 Years Later: A Lasting Legacy

- Federation of American Scientists (FAS) from 1945 to present
- International Atomic Energy Agency under the UN
- Bulletin of the Atomic Scientists and the Doomsday Clock
- Scientists engaged in economic, social, and political issues



Graphic depiction of the Doomsday Clock.  
(Bulletin of the Atomic Scientists)



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# Upcoming Programs

## INSIDE THE VAULT:

September 4 at 7 p.m. ET (4 p.m. PT)

- Battle of Antietam & the Emancipation Proclamation with Dr. Edward Ayers, Professor of History at the University of Richmond

October 2 at 7 p.m. ET (4 p.m. PT)

- Abolitionist Rhetoric in the American Anti-Slavery Almanac for 1839 with Dr. Nikki Taylor, Professor of History at Howard University

BOOK BREAKS: August 10 at 2 p.m. ET (11 a.m. PT)

- Molly Beer will discuss her book *Angelica: For Love and Country in a Time of Revolution*

