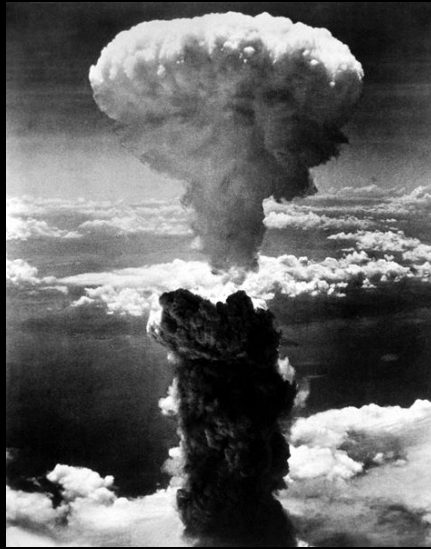
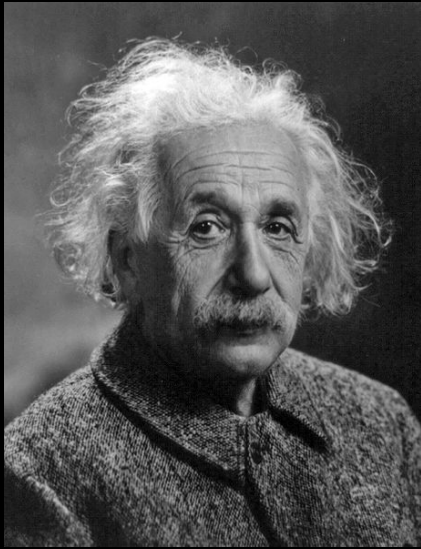


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Fall 2007

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“Atomic Secrets,” Physicists, and the Cold War

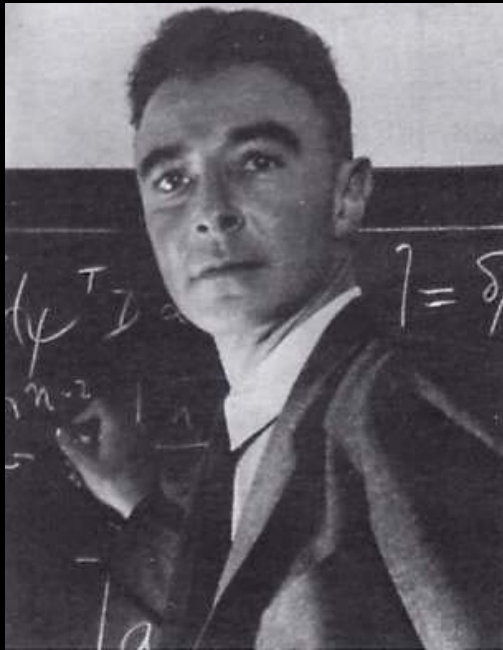


David Kaiser



Scientists in Cold War America

Which types of scientists received the most scrutiny during McCarthyism, and why?

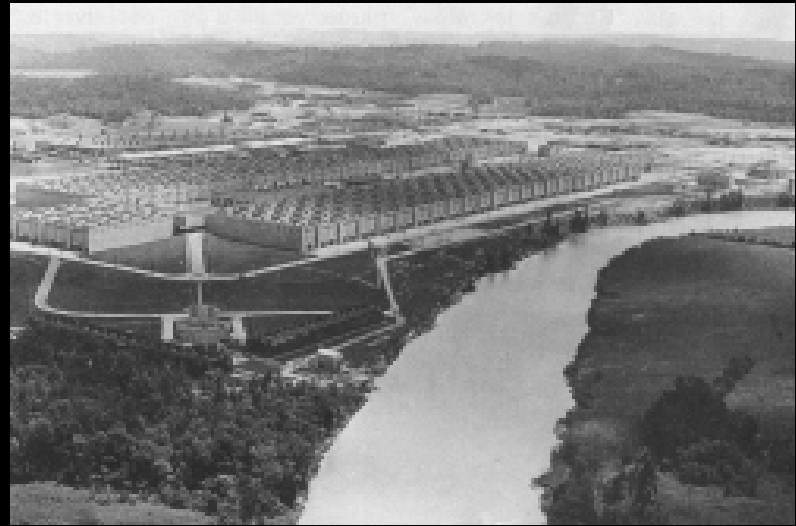


Theoretical physicists became the most frequent targets. More than a dozen cases, 1948-54. All connected to **Oppenheimer**; perhaps “collateral damage.”

The **Oppenheimer** connection might have fixed the targets, but not the charge. Look at changing image of the theorist.

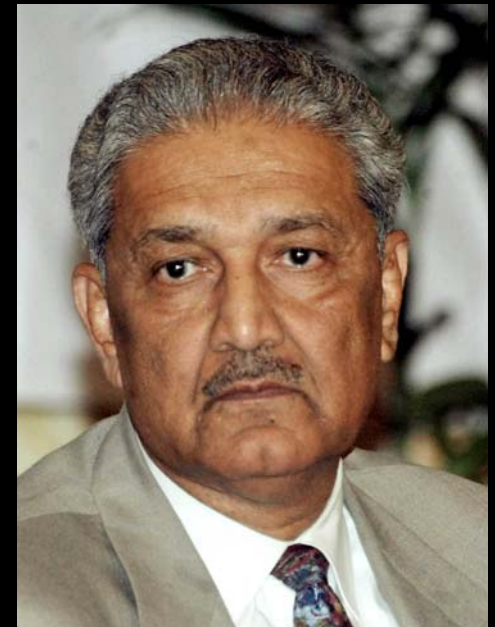
Outline

I. The Making of a “Secret”

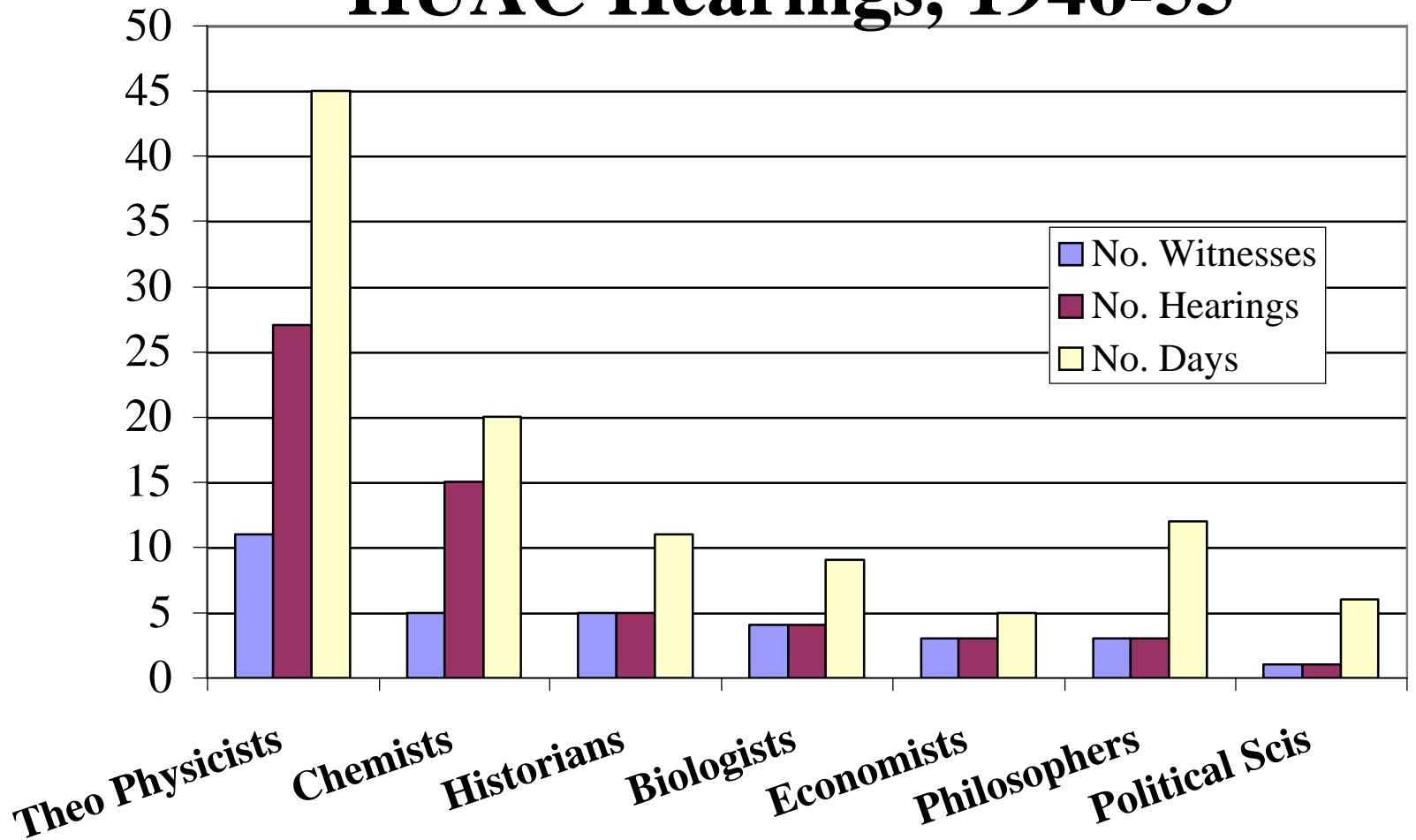


II. Theorists: A Breed Apart?

III. Cold War Legacy: Atomic Secrets Today



HUAC Hearings, 1946-55



Why target theorists?

The Work of Many People

The Manhattan Project employed over 125,000 people at more than 30 sites.

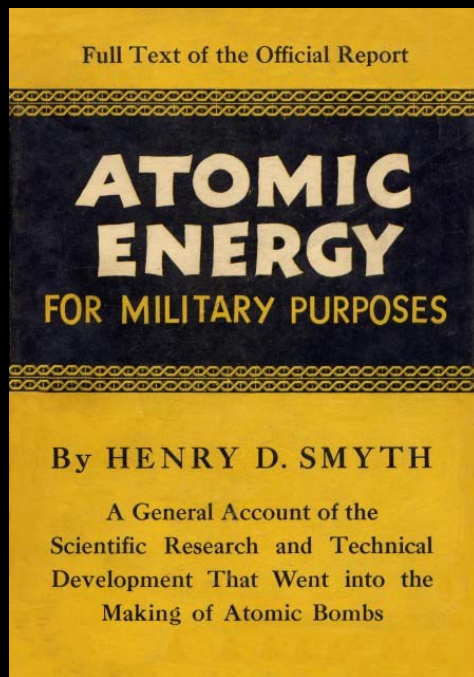


Aerial view of Hanford site

The project combined metallurgy, chemistry, ballistics, ordnance, electrical engineering, experimental physics, and theoretical physics. No group was on ‘top.’

Representing the Bomb

The *T-division* at Los Alamos could never *calculate* the bomb design from first principles; bombs have never been the mere application of formulas or theories.



Smyth Report, August 1945: could only release information that had “no bearing on the production of atomic bombs,” hence dominated by theoretical physics. Ironic: looked like theorists had built the bomb!

Rebecca Press Schwartz

The Making of a “Secret”

10 distinct responses, 1945-55, to “what is the atomic secret?” Unfolded in lock-step with changing Cold War politics.

Autumn 1945: (1) “There is no secret”: The “atomic scientists’ movement” organized to counter the May-Johnson bill; Truman and many journalists agreed that no “secrets” existed.

(2) Only “secret” was whether or not a bomb could be built; no longer secret after Hiroshima and Nagasaki.

No secrets, no need for military control of atomic energy.

Secrets, Phase I: 1945-48

If atomic secrets did exist, they concerned “know-how” and industrial capacity, rather than textual “information.”

Y-12 isotope
separation plant,
Oak Ridge



Secrets were:

- (1) raw materials and their handling;
- (2) production plants and industrial methods;
- (3) technical details of design and manufacture.

Newsweek, Time, Fortune, NYT, ...

A Category Error

Between 1945-48, many scientists, politicians, and journalists spoke of a category error: *bombs were not formulas*. Emphasized *tacit knowledge*.

Attlee, Nov 1945: Ability to build A-bombs “cannot be given in a formula or a handbook or a blueprint. It can only be done by scientists and technicians being taken to the plant, everything being shown and explained to them in great detail.”

Rep. Wm. Gallagher (D., Minn.), 1946: “The trained fingers of the technician [were responsible] – in other words, American know-how produced the atomic bomb.”

Smyth, *Life*: “There is no ‘secret’ of the atomic bomb in the sense of a mysterious formula that can be written on a slip of paper and carried in the sole of a shoe or the handle of a hunting knife.”

Cf. MacKenzie and Spinardi, *AJS*, 1995

Election-Year Politics and Atomic Secrets

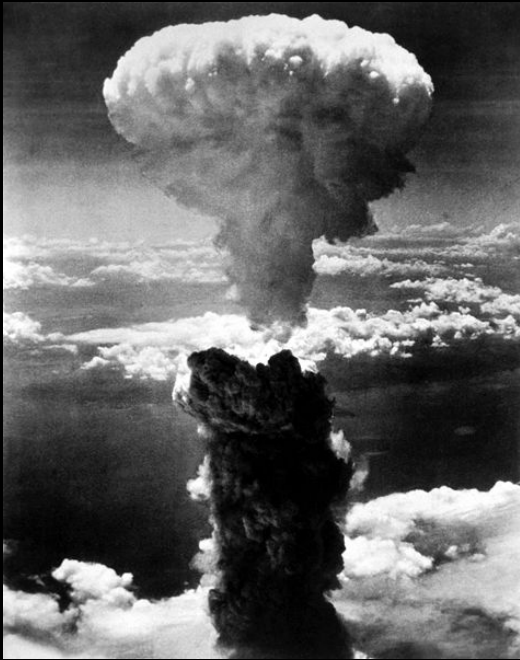
HUAC released “atomic espionage” report in Sept 1948. Claimed “Scientist X” had given “complicated formula” to Communist agent in March 1943 – and hence passed along “vital information” to aid Soviet bomb.

Time, Oct 1948: “Hot formula”

HUAC began a “trial by newspaper”: at least 8 front-page headlines in *NYT* for same story, 1948-49.

Secrets, Phase II: 1948-55

Following HUAC's media blitz, 5 different candidates for "the atomic secret" emerged. Solidified with news of "Joe I" (Sept 1949), Klaus Fuchs (Feb 1950), and Rosenberg-Sobell trial (spring 1951). All now focused on textual *information*, not "know-how" or infrastructure.



Secrets were:

- (1) "complicated formulas";
- (2) info on nuclear stockpile;
- (3) size and shape of bomb;
- (4) blueprint of implosion mechanism;
- (5) general "principles" and "theories" of bomb design.

NYT, Life, USN&WR, Time, Newsweek, Sat. Eve. Post, Reader's Digest, ...

Theorists: A Breed Apart

As discussion of “atomic secrets” hardened around formulas, suspicions grew of their purported keepers: *theoretical physicists*.

“Warped mentalities” and unbalanced education gave theorists “an almost diseased yearning to remold the world after the image of their own work in physical science.” *JCAE*, April 1951

Text removed due to copyright restrictions.
See Kaempffert, Waldemar. “X-Ray of the Scientific Mind: Its components are objectivity, curiosity, skepticism. But the scientist does not necessarily apply these qualities with brilliance outside his own field.” *The New York Times Magazine*, April 24, 1954.

Scientists and journalists agreed: theorists had special “thought processes” that attracted them to Communism.

Birge, Meier; Kaempffert, Roe

Klaus Fuchs Everywhere...

After the Fuchs case, there was a common slippage from Fuchs to all theorists.



Text removed due to copyright restrictions.
See West, Rebecca. "The Terrifying Import of the Fuchs Case: One year after his sentencing we see he united explosive knowledge and an immature mind." *The New York Times Magazine*, March 4, 1951.

Text removed due to copyright restrictions.
See *New York Times*, "Pure Scientists Called Red Prey: Judge, in sentencing student for contempt of congress, deplors defections." December 14, 1956.

Judge A. Holtzoff, Dec 1956: "From evidence admitted in other cases before this court, the court has gleaned the inference that the younger generation of pure scientists specifically engaged in research in physics has succumbed to Communistic propaganda."

(Same judge for all 5 Rad Lab theorists' cases.)

Egghead Revolutionaries

Suspicious physiognomy. Long-term trope of US anti-intellectualism: intellectuals are “effeminate.” *Hofstadter*

Rosenberg, Sobell, Gold, Slack: “puffy,” “plump,” “short and chunky,” “swarthy-faced,” “burly,” “broad build and round face,” “stocky,” “pudgy-faced,” “a little too heavy,” ...

Fuchs and other theorists: “thin, sallow-complexioned,” “stooping shoulders,” “balding head and weak brown eyes,” “frail scientist with delicate fingers,” “lanky,” “scholarly-looking,” ...

Theorists seemed to be a breed apart: distinct mental traits and physical appearance made them seem uniquely suspicious.

Conclusions: Cold War Legacy

Cold War Formula: Theorists held the most important atomic information, and were most likely to give it away.

Proof in the pudding? **May, Fuchs, Ted Hall**, ... committed wartime espionage. **Yuli Khariton** admitted in mid-1990s that espionage helped the Soviets build “Joe I.”

Need caution: Most claims for espionage’s efficacy come from former KGB agents. Every country that has built A-bombs has taken *longer* than US. Need to build up both industrial capacity and tacit knowledge. Texts can’t deliver either.

MacKenzie and Spinardi, *AJS*, 1995

“Atomic Secrets” Today

Wen Ho Lee was accused of stealing the “crown jewels” of US nuclear arsenal by downloading (textual) simulation codes — codes that weren’t even classified. (1999)

Texts versus Tacit Knowledge



Pakistan’s **A. Q. Khan** supplied equipment and trained personnel — most dangerous combination for nuclear proliferation. Yet he was still dismissed in some news accounts: after all, he’s “merely” a metallurgist, not a theorist! (2004)