# On Physics and Politics in the United States after World War II[1]

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[1]Work done at MIT; Fall'18
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*In respect to those who suffered from the Japan bombing (WWII).*

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The atom bomb was used by the US as a wartime weapon. The detonation of this recent technology got the military to realize it as a remarkable asset and subsequently, supported hydrogen bombs. This transition which continued during the post-war peacetime period – encompassed noteworthy changes in relationship between the physics community and US politics. The cause for the transition is that government realized with the hydrogen bombs, which was also true for atomic bombs at the time, that they were inherently different from all previous weaponry and to accomplish a successful business for the military, a peaceful rapport with the physics community was necessitated. Further, government realized that the new weapons were practically unrestrained in regard to the destructive potential that they could inflict.[1] This paper investigates the attitude of both the parties towards each other after the World War II. Physics gradually got taken more as resource - this necessitated more trust from physics community, which politicians worked to obtain as they sought to mitigate security concerns and the potential embarrassments in the wave of McCarthyism and Red Scare. While the concept of militaries benefiting from general advancements in technology and science is certainly not new, many physicists involved in the development of nuclear weapons argued that it marked uncharted territory in what lengths science should be applied to war; at least the US should not break any lines.

During the war, work on the atomic bomb was fairly uncontentious among those developing it.[2] The haze of war-induced euphoria and patriotism, coupled with a genuine fear of the Nazis producing their own atomic weapon, provided plenty of justification for the 'gadget'.[2] However, after witnessing the devastation of Hiroshima and Nagasaki, some took a step back. It strangely, yet nonetheless, seems from this that they didn't expect such a vast impact. Among them was, J. Robert Oppenheimer, who had enthusiastically led the Manhattan project as the director of the Los Alamos Laboratory. He is one highly significant figure in the literature of the bomb. Accompanied by others, he expressed that developing the hydrogen bomb, which was

estimated to be hundred times more powerful, "was not the road to world peace or national security."[2] Oppenheimer in one of his interview says – *"I remember the line from the scripture Bhagavat Gita : Vishnu is trying to persuade the prince that he should do his duty and to impress him, takes on his multi-armed form and says – now I have become death and destroyers of world. I suppose we all thought that, one way or another."* This colloquial supports his negativity towards the then probable H Bomb project.* While opposition to the superbomb was not unanimous among physicists, both sides advocated for their cause in policy. Strong opposition was implied in a GAC report, submitted to the US Atomic Energy Commission regarding this concern - it read that when considering whether "to pursue with high priority the development of the super bomb," "no member of the Committee was willing to endorse this proposal."[1] The Committee stated how the military advantage gained from such project could overshadow the dangers it presented to mankind and "world opinion," resulting in an "intolerable" situation.[1] Well, the outspokenness of the authors reflects their unfavorable motivation towards the future work on the hydrogen bomb. It suggested the fission weapons to be an upper-bound that America should not cross. By presenting this argument in a list of comments to the AEC, the scientists were essentially utilizing the platform to persuade the AEC in their favor and thus influence the policy; it seemed that the feasibility of producing the weaponry was not at all the center point of meetings.

While many resisted their support, quite a handsome number of physicists supported the motion as well. With enlarging of the group of supporters with time, the so-called "feedback effect" (in regards to the

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*Oppenheimer hosted a meeting at Berkeley in 1942 to discuss H-bomb's feasibility. It was only after his and Bethe's approval that Teller devoted one entire year (the last year of the war) to work exclusively on the H-bombs.[2] Further, eight days after the bombing of Nagasaki, the scientific advisory, in a report written by Oppenheimer, informed the Secretary of War of the "quite favorable technical prospects of the realization of the super bomb."[2] This perhaps doesn't fit in the plot unless Oppenheimer got gradually touched by bombing.

perks) motivated the rest to join this group as well. Further on this, one might add that pursuing the motion was no longer a voluntarily choice.

It was a necessity to have the nation's defense updated to face potential aggressions from other countries, especially when the technology was open for all the countries. Nonetheless, the ambiguity in what motivated physicists to transit towards supporting the H bomb leads no significant history other than them supporting this weaponry. This support is apparent in their demands from government and correspondingly, fulfilments of those - physicists argued for less military regulation over their work (on nuclear weapons). The Smyth Report was the first public document to reveal non-sensitive technical details of atomic bomb, which despite playing a fractional role, nonetheless composed of the open literature of the domain – unrelated to actual production engineering of the bombs. By knowing physics held no intrinsic secrets to the bomb, scientists urged that there was "no need for military control."[3] Additionally, having to work under a secretive environment for the Manhattan Project, many physicists lamented the "military compartmentalization" to have reduced the working efficiency.[2] These physicists were motivated by the later facilitated open collaborative culture in academia - it is for the "spirit of science" that they voiced their concerns.

Physicists' strength in advocating for projects is further seen in academic pursuits as they endorsed to the government for funding. In light of the scientific spirit, American physicists possessed an intrinsic interest in the advancements made by their abroad counterparts. Postwar, much new research was conducted in the Soviet Union, however it was largely inaccessible to an American audience due to language barrier. Because of resounding interest within the physics community, the American Institute of Physics sought NSF funds to produce translated journals. Motivated by a desire to outpace the Soviets, "the federal government greatly expanded its effort to translate and circulate the latest Soviet scientific publications."[4] Were it not for the motivation of physicists producing work, political funds would not have initiated on a publicly viewable project. This way, scientists' influence directed the course of federal projects. From the Cold War, we realize that after all, Soviet publications were worth to invest in.

Beyond guiding political policies, physicists also influenced the efforts of political figures. The anticipated reactions from the scientific community motivated some actions by key individuals during Oppenheimer's 1954 security hearing. Considering how big an influence Oppenheimer had in the scientific community, the Eisenhower administration proceeded with caution in their approach, lest they lose the scientific community's trust as backlash and "key scientists might refuse to work with the defense system."[5] Their approach to provide the appearance of a fair hearing was dictated by how other scientists would perceive their work and simultaneously how to ensure that they are not offended. While demonstrating that the physics community inadvertently influenced political acts, the following also hints at the point that the administration recognized physics as an asset, one contingent on trust. The same concern for their treatment by the physics community factored into Dr. Ward Evans' dissension from the rest of the board. Himself an academic, Evans argued that even if Oppenheimer was a small risk, "a negative finding could injure American science," and in particular "impair the development of nuclear physics in America."[5] His concern for the state of science motivated his political dissent to the hearing, demonstrating how valued physicists were to government. Surely, this can be further explained by how - at the moment - Evans was a member of both circles and sought to do the best for each, voting in favor of a fellow scholar, and preserving a resource for the government.

A notable change in the relationship between physics and politics in the United States after WWII is how politicians necessitated increased trust and loyalty from government scientists, a truth particularly highlighted with theoretical physicists. The falsehood of there existing a single "atomic secret" bore its pain on the reputation of theoretical physicists, originating in the Smyth Report while they ironically had the least technical expertise to conceal. As a result, those in public and government life concluded that holding the most secrets clearly made them "more susceptible to Communist influence than any other group."[3] HUAC (House Un-American Activities Committee) sessions dove looking for faults in theorists over other groups, as if they were convinced that more and more reds will come from them. The trust issues the government faced was particularly highlighted in Oppenheimer's hearing. Lapses in his recollection and changes in opinions over time are framed given to implications of lies and untrustworthiness. State attorney Robb scrutinizes all he may in the

testimony, from delaying the hydrogen bomb project to hiding Seaborg's affections on the super project.[5][6] Oppenheimer, while a pearl to the government for his years advising, yet was dismissed, simply as a used resource, because the possible security risk outweighed his merits.

Besides how politicians intended to mold the existing physics community, one very significant approach to investigate the efforts by government is to analyze the trend of educational policies, which were set to attract students in physics. The motivation for producing as many young scientists as quickly as possible was from the concern that the Soviet Union was deploying large number of physicists in the industries. Huge grants and fellowships were being provided by the federal government after the war. This was a significant change because never in history (except once in mid-19$^{th}$ century) was this much of handsome funds granted for the education from the federal level. The drastic growth in physics enrollments strengthens the above mentioned argument. The number of physics PhDs in the US was doubling after each one and half year after the war. Professor Davis Kaiser of MIT says in his interview that *"Every field in the universities was growing exponentially after the war. There were more people studying history than ever before, more people studying chemistry and art, but the rates of growth weren't the same. In fact, physics grew twice as quickly as any other field."*[7] He further mentions the huge initiatives like GI Bill which promoted people to engage themselves in physics related programs. GI Bill, in specific, was a very generous program to fund the veterans of World War II to enter higher education, many of whom wouldn't have entered otherwise.[7] Many added incentives channeled students to dive into physics, mathematics and engineering and not to other fields. Here, it is very significant to note that the primary idea of government was not to engage the new physicists in nuclear weapon construction. It was to essentially keep a record of them so that they could be lead to contribute maximum in the case of a war in future.

In conclusion, the state of physics was just as, if not more, intertwined with nation politics in a postwar America. The postwar era saw greater intensity in involvement from the scientific community in shaping policies and projects. This was a result of motivations to control and enhance the work that they did. This also put several physicists in a position to guide and be guided by national politics. Secondly, physics was regarded more as a resource to the government's ends. In order to

reduce embarrassment administrations sought respect and trust from physicists they employed, causing closer scrutiny with security. Thirdly, the education setting of the country was modified to produce more scientists in quickest manner possible. Such complex patterns of politics and physics rooted in postwar persist up to modern times. Their trails can be seen in the policies such as that concerning the peer review process of a scientific publication. Also, the fact that the number of physics students more or less maneuvers within the same trend - a trend initiated during the postwar, shows the influences of those patterns.

**Bibliography**


1) York, Herbert F. "The GAC report of October 30, 1949." In The Advisors: Oppenheimer, Teller, and the Superbomb, 2nd ed, 153-62. Stanford: Stanford University Press, 1989 [1976].
2) Galison, P., & Bernstein, B. "In any light: Scientists and the decision to build the Superbomb, 1952-1954." Historical Studies in the Physical and Biological Sciences, 1989.
3) Kaiser, David. "The Atomic Secret in Red Hands? American Suspicions of Theoretical Physicists During the Early Cold War." Representations, 2005.
4) Kaiser, David. "The Physics of Spin: Sputnik Politics and American Physicists in the 1950s." Social Research, 2006.
5) Bernstein, Bart. "'In the matter of J. Robert Oppenheimer.'" Historical Studies in the Physical Sciences, 1982.
6) Polenberg, Richard. "In the Matter of J. Robert Oppenheimer: The Security Clearance Hearing." Ithaca: Cornell University Press, ed. 2002
7) Kaiser, David. "American Physics in the Cold War." Serious Science, 2014