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The Rise of Anticommunism and its Effect on Physics and Physicists

During World War II, physicists played an essential role in the development of nuclear weapons and had a prominent role in the policy of the government regarding wartime efforts. The roles that physicists assumed were less influential in the political sphere once anticommunism began growing. In order to grasp the full effect that the rise of anticommunism had on physicists and the relationship between their discipline and politics, we must contrast physics during and immediately after World War II with physics once anticommunism had taken a prominent role in American culture. It will be clear that at the root of the growing tensions between politicians and physicists will be the fear of the influence of the Soviet Union and communist ideas inside the United States.

Before entering World War II, the opinion of the average American citizen was one of concern regarding the war in Europe. Richard Feynman describes the mentality of Americans before the war. He writes, “When the war began in Europe but had not yet been declared in the United States, there was a lot of talk about getting ready and being patriotic. The newspapers had big articles on businessmen volunteering to go to Plattsburg, New York, to do military training, and so on.”¹ It was clear that involvement

¹ Richard Feynman, *“Surely You’re Joking, Mr. Feynman!”* (New York: W.W. Norton & Company, 1985), Fizzled Fuses.

in an already serious war might be in the future of the country and that readiness was necessary if the United States was to play a part in the resolution of the conflict.

It was with the thought of imminent involvement in the war that a revolution in the way the government did scientific research came about. Starting in 1940, scientists started to get involved in more extensive government research through National Defense Research Committee (NDRC), the brainchild of Vannevar Bush, an influential engineer and science administrator. Bush had witnessed the replication of effort and the lack of cooperation between the military's programs and the civilian scientists' research and was convinced that an overarching, united research effort would be much more effective.² Some government officials did not like that the system effectively bypassed their influence, but the NDRC was approved due to its obvious advantages over an unorganized research structure, and with the threat of the war looming the politicians allowed the scientists to take control of the research organization.³ Even though some politicians were not in favor of the NDRC, Bush's influence created a strong tie between the government and physics, with research-based goals instead of production-based goals, as the politicians would have preferred.⁴

During the war, physicists played a large role in the development of and organization of the research regarding the atomic bomb. After some scientists convinced Bush that they could build a bomb, Bush approached President Roosevelt and had the

² Prof. D. Kaiser, Class Lecture (11 Apr 06).

³Wikipedia contributors, "Vannevar Bush" in *Wikipedia, The Free Encyclopedia*, http://en.wikipedia.org/w/index.php?title=Vannevar_Bush&oldid=53548778 (16 May 06).

⁴Prof. D. Kaiser, Class Lecture (11 Apr 06).

project approved.⁵ Aside from the final approval, physicists were instrumental every step of the way in the starting of the Manhattan project. After General Leslie Groves chose Robert Oppenheimer to lead the project, the influence of physicists in the wartime research was cemented in place.

Physicists were not immune to the turmoil on the horizon. If America became involved in the war, it would be in a much better position if it were prepared. Feynman expresses that it was quite easy to get caught up in the patriotic fervor, especially for physicists. Feynman passed up an opportunity to work at Bell Labs, which he valued very highly, in order to take up a job with the military in mechanical engineering.⁶ After finishing his work as an engineer and returning to Princeton, he was presented with another opportunity to become involved in the war effort. Physicists were hardly needed or recognized, and Feynman writes that, “In those days, people hardly knew what a physicist was. Einstein was known as a mathematician, for instance—so it was rare that anybody needed physicists.”⁷ It was exciting for young Feynman to be recognized for his field of study and made getting involved in the military’s research all the more thrilling.

On top of the patriotic undertones running through their heads, many physicists at Los Alamos were so caught up in the Manhattan Project that most of the time they worked without thinking about the moral repercussions or applications of the device they were building. In one particularly compelling recollection, Feynman discusses the immediate reaction to the Trinity test.

⁵Prof. D. Kaiser, Class Lecture (11 Apr 06).

⁶ Feynman, “*Surely You’re Joking, Mr. Feynman!*”, 99.

⁷ Feynman, “*Surely You’re Joking, Mr. Feynman!*”, 100.

After the thing went off, there was tremendous excitement at Los Alamos. Everybody had parties, we all ran around... Bob Wilson was just sitting there moping.

I said, "What are you moping about?"

He said, "It's a terrible thing that we made..."

You see, what happened to me—what happened to the rest of us—is that we *started* for a good reason, then you're working very hard to accomplish something and it's a pleasure... And you stop thinking, you know; you just *stop*. Bob Wilson was the only one who was thinking about it, at that moment.⁸

Many physicists at Los Alamos were so immersed in their designs, theories, and calculations while working towards a functioning device that they had lost sight of the bigger picture and the full repercussions of their work.

This complete immersion changed drastically after the bombs were dropped on Hiroshima and Nagasaki. Suddenly, physicists were thrown into the spotlight because the projects in which they were involved were "astonishingly successful."⁹ From the success of even the early embodiments of radar in the Battle of Britain to the unleashing of the power of the atom in the nuclear bombs, physics was suddenly viewed as extremely important and, "Suddenly physicists were exhibited as lions at Washington tea-parties, [and] were invited to conventions of social scientists, where their opinions on society were respectfully listened to by life-long experts in the field..."¹⁰ In addition, Oppenheimer was made the chair of the General Advisory Committee of the Atomic Energy Commission and became one of the most politically influential and renowned scientists in the United States. Physicists floated on the high times, finally receiving acknowledgement from the rest of society that their profession was valuable and interesting, and that they themselves were valuable and credible.

⁸ Feynman, "*Surely You're Joking, Mr. Feynman!*", 135.

⁹ Samuel K. Allison, "The State of Physics; or, the Perils of Being Important," *Bulletin of the Atomic Scientists* 6 (January 1950): 3.

¹⁰ Samuel K. Allison, "The State of Physics," 3.

As an extension of the success of physics and its application in the war effort, knowledge of physics became treated as a valuable resource for waging war. For instance, “The important and dangerous nature of physics was so obvious to some military officer that the [Tokyo] cyclotron was cut to pieces in the same way that one would spike the enemy’s guns or blow up his fortifications.”¹¹ As David Kaiser suggests, “The single most important resource the nation could protect was graduate education in physics.”¹² The effectiveness of physics research within the United States led to concerns regarding who had the necessary knowledge and technical capability of unleashing the atom, and the ability to do valuable science was treated like a resource worth guarding.

In addition to this new importance, many physicists felt that creating a thermonuclear device was unnecessary on moral grounds, even if it were technically feasible. In contrast to the efforts during the Manhattan Project, it became very difficult to lose sight of the end result. Robert Oppenheimer famously expressed that as a result of building the fission bomb, “The physicists have known sin; and this is a knowledge which they cannot lose.”¹³ It was an important shift in the mentality of many physicists because even though the physics was still beautiful and the problem was similarly interesting as the fission bomb had been, many researchers shared Oppenheimer’s sense of responsibility to mankind and would refuse to work on a device whose use “would

¹¹ Samuel K. Allison, “The State of Physics,”

¹² David Kaiser, “Cold War Requisitions, Scientific Manpower, and the Production of American Physicists after World War II,” *Historical Studies in the Physical and Biological Sciences* **33** (Fall 2002): 143.

¹³ Wikipedia Contributors, “Robert Oppenheimer,” *Wikipedia, The Free Encyclopedia*, http://en.wikipedia.org/w/index.php?title=Special:Cite&page=Robert_Oppenheimer&id=53800455 (16 May 06).

bring about the destruction of innumerable human lives.”¹⁴ There were similar moral concerns during the construction of the fission bomb, but there was a strong patriotic fervor that combined with the constant reminder that there was ongoing battle in Europe to overcome the qualms physicists might have had.

After World War II, the enemy had changed and there was no longer an ongoing crisis available to inspire people to be as patriotic as they had been previously, and there was no clear and tangible threat of definite conflict. Instead, the new concern was the Soviet Union and its rising influence. Moreover, the behavior of the Soviets was uncertain when compared to the behavior of the Nazi regime—and the policy with which the United States would deal with the Soviets was undecided. There were essentially three possibilities for the United States to take—the country could “do relatively little of a positive nature to influence the existing situation...pursue peace in a very vigorous sense... [or] arm ourselves and those nations which will join us in a close union.”¹⁵ Frederick Seitz expressed the notion in 1950 that “the Soviet rate of development in the field seems to be sufficiently greater than ours at the present time... [and] there is [a] grave danger that they will surpass us within the next decade. The same is probably true for other fields of military research.”¹⁶ As a result of these split opinions about the path the United States should set out on and the concerns about the Soviets, anticommunism

¹⁴ “The GAC Report of October 30, 1949,” reprinted in Herbert York, *The Advisors: Oppenheimer, Teller, and the Superbomb*, 2nd ed. (Stanford: Stanford University Press, 1989 [1976]), pp 155.

¹⁵ Frederick Seitz, “Physicists and the Cold War,” *Bulletin of the Atomic Scientists* 6 (March 1950): 83.

¹⁶ Frederick Seitz, “Physicists and the Cold War,” 86.

was a constant throughout American culture by the 1950s.¹⁷ As anticommunism grew, the good relations between physicists and politicians that had existed during and immediately after the war diminished.

As a natural result of the concerns regarding the atomic secrets and the concerns about the rising Soviet power, politicians became concerned with physicists, their resistance to creating a thermonuclear bomb, and their loyalty to the United States. As Jessica Wang argues, “Scientists, especially those engaged in research related to atomic energy, were particularly vulnerable to anticommunist persecutions.”¹⁸ Physics was strongly affected by the new feelings because physicists were the ones who had the knowledge and capability to betray the atomic secrets and also were the ones upon whom the creation of the fusion bomb depended.

The relationship between politicians and physicists became strained with these new influences, resulting in much detriment to physics and physicists. For example, in 1949 the Board of Regents of the University of California passed a requirement that its employees—administration, professors (both tenured and untenured), and facilities workers alike—take an oath of loyalty, a vow containing strong anticommunist language even though the university had an official policy prohibiting Communists from teaching.¹⁹ After much tension, the regents eventually fired thirty-one faculty members that had not signed the oath. In particular, Berkeley’s entire staff of theoretical physicists

¹⁷ Jessica Wang, “Science, Security, and the Cold War: The Case of E. U. Condon,” *Isis* **83** (1992): 269.

¹⁸ Jessica Wang, “Science, Security, and the Cold War”: 267.

¹⁹ David Kaiser, “Nuclear Democracy: Political Engagement, Pedagogical Reform, and Particle Physics in Postwar America,” *Isis* **93** (2002): 245, 249.

eventually left the University of California.²⁰ Even though the policy at Berkeley was not focused primarily on physicists, the incident does offer a particularly profound example of the impact that the anticommunist feelings that were sweeping the country had on physicists and the negative effect that these feelings had on physics.

While having a clear effect on Berkeley's physics department, the loyalty oaths were not directed explicitly at physicists, but some means of persecution were focused on physicists. One tool that focused heavily on physicists: the House Un-American Activities Committee (HUAC), led by Senator McCarthy. Even Robert Oppenheimer, who had held such high acclaim during the Manhattan Project, came under investigation for delaying the development of the hydrogen bomb as well as having a possible connection to the Communist Party and Soviet espionage.²¹ The hearings resulted in Oppenheimer's security clearance being revoked. Once McCarthyism set in, even the man who was arguably the most politically powerful scientist of his day—the man who was known as “the father of the atomic bomb” and the man with top-level clearance for atomic secrets—was not above suspicion.

HUAC's investigations did tend to focus on theoretical physicists. When compared to other groups, theoretical physicists outnumbered any other group in particular by approximately two to one in terms of the number of professionals that served as witnesses at a hearing, in terms of the total number of hearings regarding

²⁰ David Kaiser, “Nuclear Democracy”: 247.

²¹ Bart Bernstein, “In the matter of J. Robert Oppenheimer,” *Historical Studies in the Physical Sciences* **12** (1982): 196-197.

professionals in that group, and in terms of the length in days each hearing lasted.²² In some ways, HUAC's investigations of physicists were not completely without merit, as espionage was known to have happened—Klaus Fuchs, a physicist that had worked on the Manhattan Project, confessed to spying for the Soviets while working at Los Alamos.²³ However, the hearings tended to become spectacles and created a negative image of physicists in the public's eye and also discouraged physicists from working for the government.²⁴

Overall, once the threat of the Axis dissipated and the threat of Soviet influence became the most frightening aspect of the international environment, physicists generally lost their role as prominent figures and increasingly struggled with the politicians who became suspicious of them; this was, of course, in marked contrast to the somewhat cordial relations between physicists and politicians during World War II. Even the great Oppenheimer went from the chair of the GAC to a suspected spy and was declared unworthy of the nation's trust and acclaim. Even though the country produced Ph.D.s at an increasing rate²⁵ and physics and physicists remained valuable resources, people became more wary—being a physicist lost the lofty recognition that it had gained immediately following the war and at times picked up nasty stereotypes.²⁶ Anticommunist sentiments developed as an effort to fight the infiltration of American society by Soviet notions. By shifting the focus of concern from Germany and the Axis

²² Prof. D. Kaiser, Class Lecture (20 Apr 06).

²³ Wikipedia Contributors, "McCarthyism," in *Wikipedia: The Free Encyclopedia*, <http://en.wikipedia.org/w/index.php?title=McCarthyism&oldid=53809745> (16 May 06).

²⁴ Jessica Wang, "Science, Security, and the Cold War": 249.

²⁵ David Kaiser, "Cold War Requisitions": 135.

²⁶ Prof. D. Kaiser, Class Lecture (20 Apr 06).

to the Soviet Union the United States had gained another worry and the fact that the Soviet nuclear program had developed so quickly only exacerbated the worries about national security. Additionally, physicists' hesitations to work on the hydrogen bomb based on moral arguments was often seen as a subversion of American interests—in order to protect the country the government wished for the most powerful weapons and the physicists were the primary resource that could help realize that goal.

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