Oral History Transcript — Dr. Lincoln Wolfenstein

Interview with Dr. Lincoln Wolfenstein
By Patrick Catt
In Pittsburgh, Pennsylvania
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Transcript

Catt:
Lincoln Wolfenstein, and the first question I would like to ask is it okay if we tape record?

Wolfenstein:
Yes, yes.

Catt:
Second thing is I will go ahead and transcribe the interview, and any quotations I want to use in the dissertation, as well as a full copy of the transcript, I will send to you for your proofing and

if there's things that you don't want used, we'll take care of that.

Wolfenstein:
Okay. Okay.

Catt:
The first question deals with your family background as an activist or involved in politics. And you can take this to your parents, to your grandparents, or to uncles, to cousins, to brothers and sisters, as far and wide as you want.

Wolfenstein:
Well if it is as far as anything that is relevant, my father was not really politically active as you would say. My father considers himself a socialist. My brother, who is a little less than two years older than me, is a very dominating figure. I was a high school communist, this is during a time that a lot of activity. I was very much an anti-Communist, I consider myself a socialist since high school. And so outside of that, I don't think there was any particular family influence. And as far as in the back, my grandfather, who I didn't know, my father's father thought I was a Rabbi. And then who worked his own, my father, sort of revolted against my grandfather, and after he died sort of claiming to the family that he was an Agnostic. And so to think that much is political family.

Catt:
Was your father involved in any — Let me ask you —

Wolfenstein:
He was a doctor, an M.D. He was not involved in any political activities as far as I can remember.

Catt:
Okay. And your mother —

Wolfenstein:
My mother died at that point. And so, my mother's father was just interested in the stock market.

Catt:
You mentioned your brother became a communist, or embraced this, and this is in high school.

Wolfenstein:
Oh in high school, yes, they had a YCL chapter and I guess we had an American student. I was in the American Student Union. ASU it was called in the '30s and — but I was didn't like it the YCL at all, very doctrine there.

Catt:
How did your father react to it? Explain the political difference between two brothers.

Wolfenstein:

Well, I don't know that — I don't remember his reacting at all, he probably didn't care for this YCL stuff either. But he didn't — I don't really remember any communication about that, no.

Catt:
I was going to say probably some dinners, some family dinners were interesting.

Wolfenstein:
Well, no, I don't remember that.

Catt:
May I ask where you grew up —

Wolfenstein:
Cleveland, Ohio. The Heights of Ohio, exactly.

Catt:
Back when I was in New York. And how did you become — Well, I, I don't suppose in Cleveland in the Heights, there was a large query of socialists.

Wolfenstein:
Well, as they say in the Iranians in high school in the late '30s there we had the American Student Union, we had the YCL, the Communist thing. There was a time certain amount of — in the late '30s political activity. You know, the '30s were a politically active time, too. So.

Catt:
How did you get interested in science —

Wolfenstein:
How did I get interested in science? I don't quite know, but I went to college at the University of Chicago, 1940. I was trying to decide between physics and economics. And in some ways I think you know, the common thread between the two is something mathematical. So I am not really mathematical stuff, but — And as I got into it, I remember being interested already when in the ninth grade. We had a rather good general science teacher. Although he told me that I couldn't be a physicist because I wasn't very good doing experiments, my hands he didn't know there was such a thing as a theoretical physicists, which I ended up being. And in fact I was very shocked when I saw him many years later he came to out here from Chicago to take some summer course or something and I realized that he had never learned calculus, and this shocked that he was a general science teacher in junior high. But he was very good and interested in things that like the weather and studying the weather. So that was one of the things. Well it certainly wasn't that my high school physics teacher was terrible in physics. But well, anyway he wasn't I really didn't do something like a lot of experiments in science as a kid.

Catt:
You weren't like a Feynman or like a Morrison who used to build radios and things?

Wolfenstein:
And things like that, I wasn't as much involved as —

Catt:
With your father and his medical background, one would suppose either medicine or life sciences biology.

Wolfenstein:
No, I don't think so. My father was an opthamologist [???]. And again, there was no particular attempt to interest me in that. But people like — my father, this is interesting, was quite intellectual, and I don't know to what extent I thought at the time, I know I think in retrospect, you know, that he merely, you know, being a doctor was not really what he would have liked to do. He was more intellectual than that. His undergraduate degree was in philology at John's Hopkins, and then [inaudible]. And so you know and then it was clear at a certain time what do you do, well, you become doctor [inaudible]. Again, for the century of for it become a Rabbi. And he at that time of the beginning of the century, it was time to decide what you do is become a doctor. So it wasn't pointed out as the thing to do. And oh, I had an older sister who was active and majored in philosophy. She wasn't sure what my brother was going to major in. I found out my brother eventually majored in mathematics. So, so.

Catt:
Did he become a —

Wolfenstein:
My brother went through a complicated career. He dropped out of college after two years, has a child. He eventually got his Ph.D. in sort of [???] Latin, and spent 25 at [inaudible] years of his life in Paris. [Inaudible] professional mathematician. So anyway, he chose the sort of direction that was much more intellectual things than being a doctor.

Catt:
In your case more —

Wolfenstein:
In my case, my own tendency something sort of mathematical. I did want to go into mathematics, but I wanted to do something sort of more in physics or economics.

Catt:
When you were growing up in the '30s, it was a revolutionary period in physics. Were any of your heroes… or maybe heroes is too strong. Role models —

Wolfenstein:
I don't know, I don't have any feeling for that, I don't have anything that I don't have retrospect recollection about physicists people in that way. And I don't remember reading about a particular scientist. I may have, but it does seem a big deal.

Catt:
Why the University of Chicago —

Wolfenstein:
Why University of Chicago is interesting. I guess my brother had gone there actually for two

years. He was two or three years ahead of me, and then I said he dropped out. But I wasn't — I applied I think a number of places, and they gave me a scholarship is probably why I chose them over other places I had applied to like Columbia and others, wanted to go to the good schools. They had offered me some kind of scholarship. [Inaudible]

Catt:
Okay, did she enter in 1940? Also time of the year for where other events were starting to —

Wolfenstein:
Oh, yes, oh yes, I was very anti-war. Anti-war.

Catt:
In what way —

Wolfenstein:
You know, I —

Catt:
As a pacifist or just —

Wolfenstein:
Not exactly. Politically my position was that anything the U.S. would do would be bad because the government was bad, and you know, we would only get into — any war we did would be an imperialist war was sort of my position. To which — I mean my father disagreed that because of [???]. And I remember in college I had one friend who was a Communist was very much against the war until the Russians got involved. And then there was a force where everything had changed. Fighting was [inaudible].

Catt:
Did it change for you after that —

Wolfenstein:
It didn't ever really change for me. I never felt that what the United States would do would end up with a bad result.

Catt:
If I were to described you as a isolationists, would that be too strong —

Wolfenstein:
That's rather strong. I really I think I mean I wasn't an isolationists. There was a really cause that you know would have to you know really had an international policy, which was one that really was helping other people was one thing, but that wasn't the kind of international policy we had. So I just thought that it was imperialistic. I thought that that was against everybody. But I don't pretend that point of view now.

Catt:
Okay, I never quite heard the war as described as imperialist, but —

Wolfenstein:
I thought I thought the U.S. as being imperialist.

Catt:
Right, right. I take that back, there have been some works that have looked at that particular. Obviously with the war, the Holocaust, and you come from a Jewish background, were you raised as an Agnostic or —

Wolfenstein:
My father — I was raised as a — with an agnostic, my father was an agnostic. I mean my father knew a lot about the Bible and so forth, but never went and I never I know the history and so.

Catt:
Okay. What affect did it have on you around 1942, obviously the University of Chicago is one of things that had physics research, starts to get involved in the Manhattan project. The Met Lab, I mean right there.

Wolfenstein:
I knew nothing about it. I always tell my students that there was — I used to walk every day down Ellis Avenue down and 57th, down 56th down pasted Stagg Field, right down that field, the first reactor was being built, and I knew nothing about it. And if I had known I would have at least gone to the other side of the street. But you know, I was waking maybe 130 feet of that reactor because it was right under the fence of this football field. But I knew nothing at all about it. I thought it was a secret project. But you know, in retrospect was hard to see it walking down the street. But I knew nothing about the fact at all.

Catt:
As an undergraduate you're really not in the circle.

Wolfenstein:
I wasn't in the circle at all, that's right. If I had been a little more perceptive — I didn't know any nuclear physicist or anyone who teaches nuclear physics or anyone who knew too much. So as a result [inaudible] graduate student. But it is funny in retrospect. I knew nothing what so ever about something going on there.

Catt:
In 1944 all of the sudden when all of the sudden Fermi and others started leaving.

Wolfenstein:
I didn't know they were there. I didn't know they were there. I didn't know anything about the people that were there. I mean, I should have recognized that there weren't that many physics professors around. In fact that some physicist were doing war work, you know. In fact, when I got my — I really — Somehow I managed to stay there as a student, and got my masters degree in May of 1944, and I should have probably noticed that there weren't so many physicists around, but I knew that physicists were doing war work. And in fact I almost ended up going to Oak Ridge. I had some communication at Oak Ridge, and I didn't know it was operational, it was at Site Y. I think it was Site Y. And had some communications. But anyway, so I ended up

back in Cleveland by chance working on jet engines. At NASA, which was then called NACA and the during '43-'44 I was working on your masters degree, I was teaching at the college in Chicago.

Catt:
In elementary physics?

Wolfenstein:
In elementary physics. There were pre-meteorologist physicists that had the same idea in start students in physics and train them to be meteorologist. So they had all of these kids there. Then about after they studied physics and a little more, somebody said we had all of these meteorologist working on [???] and they sent them [???] meteorologists. We need some [???] the damn weathermen. But anyway, it was one of those things that go with. So anyway, the thing that was remarkable was I knew nothing whatsoever, I had gone to work in Oakridge [inaudible]. I didn't know any nuclear physics, and I was surprised anybody [inaudible].

Catt:
That's my next question. When you are working on MS, still theoretical physics. What was your thesis on, or your research —

Wolfenstein:
My thesis my masters thesis was on cosmic ray showers. And part because there weren't too many people to work with there and Marcel Schein was around and so he was doing work on cosmic rays so I did a theoretical thesis on cosmic ray showers.

Catt:
How do you spell Marcel Schein? Can I get his last name.

Wolfenstein:
Marcel Schein, S-C-H-E-I-N. Marcel Schein. The thing I can always quote on Marcel Schein was when he learned that — when his son wanted to go into psychology, he was extremely upset, and he said, "Psychology will not be an exact science for 500 years." [Inaudible passage]

Catt:
So what was your reaction to the bomb —

Wolfenstein:
Well, I don't know exactly I gradually became to realize what it was about, I don't know. I can't — you know, I don't remember when I gradually became concerned and politically concerned about it. But what is interesting. I went back in 1946 to get my Ph.D. in Chicago, and everybody, I mean, probably half of my fellow graduate students had worked on the bomb. Physicists had worked on the bomb. And yet I don't remember at that time, you know, I shouldn't interested in it, but I can't remember, you know, much about political activity at that time. But there were issues there, but I don't remember being much involved. The thing that always amuses them when I tell my students is this. My thesis professor was Edward Teller and he was amused about that. But again, I didn't know of course anything about those issues going on at Los Alamos — that I didn't know anything about. But they called it the Super that they were so

interested in. And the other leading professor there was of course was Fermi. But I don't remember those issues. I'm sure I was interested, but I don't remember any particular activities or there were not many discussions from those days on themselves.

Catt:
I think you didn't get involved with what was called the Los Alamos scientists, which eventually became —

Wolfenstein:
Federation American Scientist. I don't think — I know when I joined the Federation, when I had become a member or when I joined it. I don't remember being at all involved. Remembering fellow students, we were all very much supposed to be getting our degrees, and I don't remember some of those days — I mean some of them who were my fellow graduate students [???] certainly were working on the bomb. And some of them certainly became quite active. We had a group of sixteen students, sort of the first group of post-war students there except on exam, and [inaudible] of sixteen, three of them won Nobel prizes of those particular students. And a lot of them became quite. Owen Chamberlain, I don't know if you know him. You should try to interview Owen.

Catt:
Yeah, I tried.

Wolfenstein:
You did.

Catt:
I got to look at his papers though.

Wolfenstein:
Oh, you did. We went to see him last month… month before last. We went to see Owen, but he is not in very good condition now. But he was quite active. He was someone who was quite active. But at the time we are talking about, that I don't remember much from those times. It was just a whole lot of people who were involved.

Catt:
But there is also at the same time (we talked about this before the interview), the military control, the May-Johnson Bill, military control, Vannevar Bush's Science, The Endless Frontier. How can we plan post war —

Wolfenstein:
Yeah, those were two, yeah those were two different, but related issues. Yeah, there was an issue of the May-Johnson Bill. That was a big issue then that was sort of a major issue around the scientist organizing. So I know it is funny, it is as I think I know it is more of history that in something happening — partly lack of memory, partly because I was involved with trying to get a Ph.D. and having a baby and getting work, I had lots of things on my mind.

Catt:

To become a political activist —

Wolfenstein:
Yeah.

Catt:
Working closely with Professor Teller, did he ever discuss these issues with you —

Wolfenstein:
Never.

Catt:
Never. In other words you said well —

Wolfenstein:
Never. I never knew.

Catt:
Not even the military funding of the science —

Wolfenstein:
Never, never discussed anything like that. He may have discussed some things though generally with Fermi because Fermi would have gone to lunch with us. Fermi was always very active. But I would discuss my physics with Teller was all. I don't remember him ever having any [???] particular students to [???] seeing him so I could discuss my thesis with him when he was coming or on his way to Los Alamos to Brussels. I would talk to him awhile. But we didn't discuss other things.

Catt:
How about amongst other graduate students —

Wolfenstein:
Again, I don't remember. I don't really remember if there was any discussion.

Catt:
Okay. Well I was going to ask you why you went to the University of Chicago, but you pretty much avoided the answer.

Wolfenstein:
Well, I went back to I went back. Again, I didn't think I was going to go back as far as I didn't really know, I'm not sure I even knew that Fermi was there. I went back because they gave me the best offer for a graduate course. I went back to Chicago because I was lucky because I didn't know that Fermi was there. That was one of my fellow graduate students [???] Yang, Frank (Chen Ning) Yang, went to Columbia because he thought Fermi was going to transfer to Chicago, and he found out that Fermi was in Chicago.

Catt:

Was Leo Lederman there —

Wolfenstein:
No, Yang. Yeah. Anyway, Leo may have not even gone, I don't know. The other one was Jack Steinberger. I don't know if you ever heard of Jack Steinberger. Jack also later on in Europe, he was [???] spectacular about nuclear weapons.

Catt:
So you finished up you Ph.D. in what year —

Wolfenstein:
1948.

Catt:
'48. Which also happens to be about the same time, within twelve months, of when the Soviet Union has the bomb.

Wolfenstein:
Has the bomb.

Catt:
And now, how does that start to have an effect on you —

Wolfenstein:
Oh, I don't know I mean the issue the big issue, and I guess again I can't — I don't have much personal memory about it. But the H bomb issue became public. It became public and question of whether to build the H bomb became public, came to a forum public [???] when Truman announced they were going to do it. But they were, again, then again the they think why we shouldn't do it. And so thought there was that debate was sort of the issue whether we should get into an arms race. But again, I must say, from that period, I again don't remember any great activity or concerns. But I don't remember… I don't remember that particular activity at that time.

Catt:
Can I ask what your Ph.D. thesis was —

Wolfenstein:
My Ph.D. thesis was took me a number of years was about the polarization — the experiments using polarized protons. No one had really done the experiment. It was the spin of the proton was in a certain direction and you look at the effects of the spin. And so that was — I became an authority on that subject.

Catt:
And that was a theoretical —

Wolfenstein:
Purely theoretical.

Catt:
When you start talking about experiments, I was wondering what —

Wolfenstein:
All of my theoretical work has been related from that time on. And of course, [???] from Teller for that. But the theory related to the experiments [inaudible] when all my life has been that.

Catt:
Did you have any classes or any, I don't want to say collaborations, but did you work with Bob Sachs while you were there —

Wolfenstein:
I did. How do you know about that? Where did you hear about that —

Catt:
Bob March is an advisor.

Wolfenstein:
Who —

Catt:
Robert March — Bob Sachs was his teacher. And one thing that he mentioned that during a period, and of course, Bob came after you a few years was Professor Sachs was very, he talked a lot about the Social responsibility of the scientist to his students. And I was just wondering if you had some experience with any faculty or with other grad students about here you are you should go as you are finishing up and becoming a Ph.D., a theoretical physicist, right now at the end of course work period, this is quickly becoming elevated to something of a national resource, and the issue of well what should we be dong with our science? What should I be doing as a scientist —

Wolfenstein:
I don't remember — yeah, the first paper I wrote related to a little paper I wrote related to this subject. Then again my thesis was about that, and we wrote a paper together. My thesis was with Bob Sachs, we wrote a paper together. He was in Chicago during the summer I was working for [???] and he was my sort of in effect my supervisor. So, [inaudible passage] for that. So yes. But I don't remember either him or others. Again, it may be a memory issue. I don't remember any great emphasis being on that. Note: Wolfenstein is referring to his article, "The Tragedy of J. Robert Oppenheimer," Dissent, 15, (No. 1, 1968), 81-85.

Catt:
Okay, this is an issue that we are going to talk about. Moving into the '50s, you start to see something or for whatever lack of words, the Red scare, McCarthyism. You talk a little bit about it in your article The Tragedy of J. Robert Oppenheimer. It wasn't so much that the McCarthy trials that the science should have been afraid of, it was the military, that was military control. What did you have that? Well okay, before I ask that, after you finished up your Ph.D. in Chicago you came here —

Wolfenstein:
I came here directly. I've been here ever since.

Catt:
Okay, and I think you started in the Fall of —

Wolfenstein:
1948, I started that year.

Catt:
It is called the Cases Institute of Technology —

Wolfenstein:
No, no. Carnegie.

Catt:
Carnegie, I'm sorry. I was thinking in Cleveland WOLFEINSTIEN: Carnegie Institute of Technology. Tech.

Catt:
What was that like, coming here —

Wolfenstein:
What was it like? I had a young assistant professor, and I started to teach and I was living alone then.

Catt:
Were you brought in to start up a theory group or —

Wolfenstein:
No, no, no. I was brought in — They were sort of rebuilding the department. There was practically nothing here, partly at the end of the war, but partly they really didn't have, they had had one great star professor here and that was Otto Stern. But he had gone back to Europe. There was one his assistant, an older man named Esterman [?], and he wanted to build up like a whole group here in physics in a building. I was just a young person. They were bringing in lots of people. The person who actually hired me was conservative citizen, a man by the name of Frederick Seitz. He was the one who actually hired me, then after one year he left to go to Chicago, Illinois. So they were building up a group [???], but I was just a young professor. [???] Coroban, Schringer [?] who was from Australia. And so there were a number of people. I was not particularly a leader. And then after a couple of years they hired Gian-Carlo Wick, an Italian physicist, who was kicked out of the University of California because he wouldn't sign a loyalty oath. So he was a rather politically active person. I went to that meeting [???] here. And so he came sort of while I was [???] assistant professor.

Catt:
Well, I was going to ask you if there were other positions offered to you, and then why did you chose to come here —

Wolfenstein:
No, it was the only one that was offered. They only had offered a group of us had went off to the physicist society meeting in Washington in April looking for a job.

Catt:
Were you approached by the military to —

Wolfenstein:
No. [Inaudible passage].

Catt:
Okay, well you mentioned the loyalty oath. That ties in directly with the McCarthyism at universities, especially among scientists. They start to say wow, we have nuclear scientists working for us, and the defense of the nation is felt largely upon the scientific development. Going back to Bush's statement, that strong technology was built on strong science. Was there ever a loyalty oath here —

Wolfenstein:
No. I don't think there was any — I don't really think I don't remember, [???] local issues. I don't remember there being any issues of that sort.

Catt:
And then more generally, your reactions to McCarthyism.

Wolfenstein:
Well, I was never against McCarthyism and so forth. The question you want to ask is, you know, is there any particular personal experiences that is relevant, and I don't really think I had any really personal experiences. I mean the one thing that was somewhat related to, that was before McCarthy, there was a kind of in the late '40s there was in New York they had the oath, and in fact they was there some sort of reactive group there to McCarthyism in New York State. And in fact Rapp-Coudert Committee that —

Catt:
Could you spell that for me?

Wolfenstein:
I think it is R-A-P-P, it was just from memory, but it is C-O-U-D-E-R-T. Now I think that was their legislature committee. Anyway, the reason for it — it's hard to explain my brother, the most immediately reason he left the country was he was speaking at city colleges where he was going to be kicked out of because of his politics, and then he left strangely enough to fight in Israel, and then he left Israel because stand it anymore, and he was wounded there, and went to he was Paris. And so he was affected by what was going on. But, outside of that, I don't think whether I or other physicists I knew were really among many physicists who were affected. But they weren't ones I knew, so I just knew second hand, like Frank Oppenheimer, Joseph Wienberg, some of the people who — I knew [???] personally.

Catt:

Or Condon [???], of course.

Wolfenstein:
Oh, the Condon issue. Which you probably studied. [Inaudible] studying Condon. There is a professor, [???], David Hounshell. He was running a Cold War seminar. And he seemed to be studying catastrophic papers.

Catt:
There a dissertation put out about Condon by Jessica Wang at MIT, on his article.

Wolfenstein:
Oh, yes, she came to talk here. [Inaudible passage]

Catt:
And then I spent some time in Colorado with him.

Wolfenstein:
Oh, really.

Catt:
And George Salzman is another one.

Wolfenstein:
George Salzman!

Catt:
Yes, he seemed to know.

Wolfenstein:
You came across George Salzman —

Catt:
Yeah, I talked to him.

Wolfenstein:
Oh, how is he doing? Where is he at —

Catt:
He is at U.S. Boston.

Wolfenstein:
He is still at U.S. Boston? Hmm.

Catt:
Between them, I've always been a bit fond of Condon. And then of course, Oppenheimer, which you have your piece on that.

Wolfenstein:
Yeah. I mean I have heard him talk a couple of times.

Catt:
Well as a scientist or a physicist, what do you think of — I know it is in your piece, but what was your reaction to Oppenheimer's case —

Wolfenstein:
Well, I thought it was a very interesting experience, the Oppenheimer hearing. Whether I have a copy of them or read them, I was impressed with the submission to all of this questioning here of the facts. You know, that he was the man in charge of the bomb project, and now he is being treated in this fashion is something that something I see quite tragic about the way he was being treated, in spite of the fact that it with the exception of Mr. Teller. [???] thesis of [???]. He received a great deal of support from the scientific community. And then Teller suffered from this [???] really condemned everyone for his behavior. So, Oppenheimer had this great defense, and yet, [inaudible] change a man after that. But of course part of the story was that it was symbolic in the sense in which the scientist could be used, but then when they tried to influence the policy it could be so rejected.

Catt:
So you think that had an effect on scientists, or especially their activism —

Wolfenstein:
Well, it is interesting. One of the issues that persists is called in the "insider-outsider" issue, that particularly is in his book, by two friends of mine, Joel Primack and Frank von Hippel, Advice and Dissent: Scientist in the Political Arena.

Catt:
Advice and Dissent.

Wolfenstein:
They wrote this while they were working in a post office slot in the late '60s and in fact there was something called SWOPSI which stands for something, something.

Catt:
Workshop.

Wolfenstein:
Stanford Workshop on Political and Social Issues, something like that. And so the post-doc courses — they set up a workshop in these courses.

Catt:
Martin Perl was the advisor.

Wolfenstein:
Marty Perl was the advisor. And Joel and Frank were [???] post-docs there. And they gave — this came from [???] Advice and Dissent. But the thing that focused on the "insider-outsider"

issue was the fact of those scientists who work inside the government and those who work outside. If you are inside you sort of co-oped and you can't really speak out. If you speak out you get into trouble, like Oppie did. And so it was sort of what I thought was interesting was that for a little while, Frank really became an insider. He was under John Gibbons on the scientific advisory committee on [???]. And Hipple, he joined and was an expert on nuclear weapons problems. I think that a couple of years he just couldn't take it because of the frustration of being and insider. He was that he talked about in the book about how frustrating it is to be an insider.

Catt:
He has an autobiography out —

Wolfenstein:
Oh, there is something put out by AIP.

Catt:
Scientist as Citizen.

Wolfenstein:
I haven't read it.

Catt:
I haven't read it yet.

Wolfenstein:
I haven't read it. I know about it. Then Joel really continued to be quite politically active, and I guess he still is. He is professor [???]. But Frank von Hippel [???] to be a professor not in physics but in some sort of public policy. But Joel is a physicist and still very active. [Inaudible passage]

Catt:
We were talking about the affect that this had —

Wolfenstein:
On Oppenheimer.

Catt:
Right, right. You had mentioned you grew up and you were identified as, self-identified as a socialist. Obviously in the 1950s anything towards the left was, I don't want to say it was dangerous, but it could be speculative as people were saying — suspicious that is what I am looking for. Were you forthcoming with the equivocal user at the time —

Wolfenstein:
I don't think so. As I say, I don't remember being particularly politically active in saying exactly the major issues.

Wolfenstein:

Well I don't remember again, I don't think I ever particularly shared my views, but I don't think sometimes think what I did in the 50s and I just don't remember anything that political until in the late '50s we were involved in saying of course that was the nuclear policy, I don't know think I think of speaking out, but I don't know what opportunities I had.

Catt:
So you don't recall having any chance with the chair saying, "Professor Wolfenstein, perhaps you would be…"

Wolfenstein:
No, I don't think those issues came up. I don't have any strong feelings… any feeling of anything that came up. I didn't have any reason to be outspoken, and I don't remember any specific occasions, I don't even remember what letters — I haven't written any letters to the editor recently but I used to regularly write letters to the newspapers. But various people used to stop and tell about the [???]. But I don't even remember if I started that in the '50s or not. But anyway, with respect to the specific question of whether I felt any kind of pressure of anything political, and I don't think so. Or do I remember at that time any particular issue with respect to the university, later with respect to the university. That was much later.

Catt:
What in your opinion how most American's viewed scientists in the '50s? Or the physicists —

Wolfenstein:
One of the things I think is that the physicists is very much associated with the bomb. It is about the only thing people knew about physicists is that they did the bomb. And I know that one of the motivations, again in the '60s, try to teach various courses for non-science people that embarked on ideas [???]. But to restore the image of what scientists did, and physicists in particular. But certainly, physicist were people who make bombs I think are pretty much the idea people had. And so they go with the thought that they were very important and [???] true. That so dominated what physicists were doing compared to any other applications.

Catt:
I take it you probably didn't embrace that view. Or encourage that view.

Wolfenstein:
Well, no, no. Naturally, [???] scientist made wonderful discoveries, and not even with something of what many physicist tried to sell a less lethal product that might be related to responsible actions and things like that. But my own line is a wonderful thing about physics is a wonderful way to learn about the universe and understand the laws of the universe and that sort of thing, and not the applications.

Catt:
What were your reactions to Sputnik —

Wolfenstein:
Sputnik. Sputnik, and what do I think here. Somebody is threatened by Sputnik. I don't know. Again, I mean, they never know what was my recall at the time and what my recall of what I

might have said about it in course in course work comes first. So I guess I don't really know where I was then.

Catt:
Within the general public [???] was this sense of immediacy. First there was the initial shock, if you will, that the Soviet Union now has the bomb. Now all of a sudden they have a bomb missiles large enough to put things in orbit. Well, we are behind. Our scientists and technologists for the past ten years have led us to believe we were ahead, and all of sudden we are behind.

Wolfenstein:
Yeah, I don't know. As I said, I read so much about it that I find it hard to remember what I thought immediately at the time. My theory all the time this arms races was going on and we thought our reason was to find ways to stop it. But a lot of that — so much of it is retrospect that I read about all the government committees thought we didn't know about it at the time, that —

Catt:
One thing that does is that it really starts to put money into science — the government really starts to define the science after Sputnik. You know, the Education Act, okay, we need more scientists, we are behind. What we need to do for us to have the greater modern days of scientific talents and push the peak up.

Wolfenstein:
We're gradually — you know, the Defense, I know why they had sort of the Defense education scholarships, that it may have dated from that period, which may it certainly I have — I suppose it reached some of the numbers of graduate students. And I am trying to think. Really '60s what really made the big growth in terms of jobs and really large growth in education, in fact really in the '60s was when the space program really got under way. There were a large number of jobs for people. Also it was in, I mean, all the new stuff [???] about the university [inaudible] and so forth. And I suppose in my case and the local case that we were evolving. I think they were sort of expanding anyway gradually.

Catt:
One thing I have to ask is the fall of Sputnik, is a group of this great scientists —

Wolfenstein:
Ah, the effects of the nuclear war in Pittsburgh. You know well you know what the issues was on that —

Catt:
If Pittsburgh was under nuclear attack. Note: Wolfenstein is referring to the Pittsburgh Study Group for Nuclear Information's pamphlet, The Effects of Nuclear War on the Pittsburgh Area, (privately published June 1, 1962).

Wolfenstein:
Well, it was in reaction to the civil defense, the bomb shelter. The bomb shelter. Which really

was Kennedy. Or any of the Kennedy's. Oh, they were reasons to take nuclear war more seriously. And of course with the question of ICBM coming up, there was the famous missile gap. You know, the missile gap. And so — and Kennedy had the Kennedy issue on the missile gap. And so when they came and they said well really, the Russians were going to have all these missiles and they didn't have it at the time at all. [???]to build a thousand ICBMs, you know, as [???] says in his book, if you had different numbers of fingers on your had you had a different number of missiles, so sort of building a thousand because you have ten fingers on a hand. That was the calculation basis of how many [???]. But once they committed to an ICBM, then they said well, the Russians [???] have ICBM, and we have [???]. So the risks report, a group [inaudible].

Catt:
I'm sorry, I missed that —

Wolfenstein:
No, I have it somewhere in my office. And so these people, I was involved with people I had a whole list of people who were involved. There were different directors at the time. Dan Bolef was one of them. You may have interviewed many people on this list. Some were more active than others. But mainly from Pitt, I guess. John J. Satchel, he was an editor of the Einstein Paper at Boston University. Yeah, so that was sort of – [???] was sort of in the fifth generation of scientists because [???] in the end. Association of American Scientists. So that was one of the [???] about [???] the bomb shelter. And the concern was the idea that somehow the bomb shelter became an accepted idea of hiding and winning a nuclear war. It was crazy. So we tried to do a detailed analysis [inaudible]. [???] bomb shelters weren't going to safe you in a nuclear attack [???] Pittsburgh, and there were similar studies in Detroit and [???]. But that was a time when a whole group of people and scientists. So that was one of the things that were effected

Catt:
I was going to say, can this be indicative of people becoming more openly or visibly, or socially —

Wolfenstein:
No, I don't think so. It was just it was somehow at a nuclear sub-organization. I don't know how long the federation group had been gathering together at that time; probably for a while. And at the same time, around the same time in the late '50s, a different group of people some were involved in this thing, Pittsburgh Committee for a Sane Nuclear Policy that was also and somehow involved with different people called scientists, these people. And I think most involved was one of my colleagues, Sergio DeBenedetti, who died a few years ago, who was involved with that. And then [???] Harold [???], who died a few years. [???], who was a person in the community, not a scientist. So it was sort of a group that was not academic [???] nuclear policy. So in the '50s I was active in both those groups, and probably writing the letters to the newspaper. So I don't know if I was speaking out necessarily. More that these groups that were nuclear — The issue that really I think more than the Sane Nuclear Policy was the bomb shelters. That was the big issue [???], [inaudible], stopping the bomb threat. And the thing that was very visible was the issue of fall out, the way in which that issue was brought home so much. Leading of course to the final sort of Pyrric victory of the limited test ban in 1963.

Catt:
At this time in your research, what was the nature of your research at this time? And also how was it funded —

Wolfenstein:
The funding is in its best. That is the funding of the research. There is a whole history of funding. My research was always started out to be called nuclear theory or nuclear physics, but it became gradually understood to be elementary particle theory. It started [???] because we didn't have [???] called elementary particle physics, and the elementary particles. But gradually there was a nuclear theory on the particle theory, on [???] particle theory. And so then [inaudible], and I began to work — Well, again I began to work on weak interactions, and I've been working on it ever since. The funding of the research: during the first funding we had funding for a group, a theory group, and the first funding we got was again was from the military. That was practically the only source of funding in the '50s. The NFS Foundation had started, but in fact they had no money.

Catt:
So the groups like ONR and Air Force Office of Research —

Wolfenstein:
That's right, I think the Air Force Office of Research that I'm certain was the first funding. I remember that it was a joke that we were funded by the Air Force Office of Research for doing the meson theory doing metaphysics. [Inaudible sentence] And so we got the funds for a year and we wanted to get funds for the meson theory. And after we came back from the auditor, the auditor said no because we bought the meson theory from you last year, why are you trying to sell it to us again? Any way, we got some money from the Air Force. So it was clear the reason they didn't know why we were doing it. Because ONR was doing it and they want the department to own it. Now I don't now remember was at what point our funding being began to be funded by the AEC, and then it became something else, and then became DOD, and then became something else [inaudible] So, I don't remember when. And so later I became concerned with the question of the military support, which to some extent we are always concerned with [inaudible] from the May-Johnson of military supporting research. It had been a real concern for a long time, military support for research. But in the '50s the fact that there was no other source. They seemed to get more of that kind of support. Well, in fact I remember now would be of course the AEC, or further the DOD.

Catt:
Did you make a distinction between pure and implied research? I know some scientists will say well it doesn't really matter who's funding I'm doing pure research, I really can't see any application why meson theory, for example. Did you buy into that distinction of the two —

Wolfenstein:
Well, in some ways yes. I believed what I was doing was pure research and it had no applications. I always thought that [???] in all the research I had done had been useful [???] and it no applications. I mean, that doesn't mean that stuff that all these research people should do should have no application. There were always occasional threats that something might have an application. I was always concerned about the possibility that things may happen

when people would try to sell the research on the basis that oh well, maybe make a [???] bomb or something [inaudible]. Not that we should [???] that the other fields of research that wasn't working and clearly could have an application. And I was working in nuclear physics, which had applications, and so I was concerned how the whole question was how scientists have been used and people were concerned about that, that bomb, and I felt that as a scientist I had that responsibility. On the other hand, I didn't mind the fact my own research was pretty useless.

Catt:

Did you ever turn down funding source? Did anyone ever come to you and say, "Professor Wolfenstein, we are going to give you x amount of dollars for you to do this research" —

Wolfenstein:

No, I never had the opportunity to turn down any amount of money. Because for one, the only time I did get funding was the meson theory in the '50s, and no one — I was never doing anything which tempted anyone to give me money. There was a time when we all pledged that we wouldn't take money from Star Wars in the '80s, and they went around asking everyone to sign a pledge saying they wouldn't take money from Star Wars. And I had colleagues who could have gotten money from Star Wars and for whom was the real issue, but I didn't have to worry about that.

Catt:

Moving into the '60s, you have other issues of nuclear confrontation of the Cuban Missile crisis, right? What were your thoughts on that —

Wolfenstein:

Well, my thoughts at the time on that were very scary, like most people. It was a very scary time. And the moral of the story I was I tried to emphasize to show how dangerous nuclear weapons were and how consequences were to emphasize something that was very dangerous and that in a nuclear arms race can become unstable. And I worked hard to define the control of nuclear weapons. It was in this period, in the early '60s, that it came a kind of bifurcation between two words: disarmament and arms control. Arms control is a word invented in the 1960s. And the people who were for nuclear disarmament were very suspicious of the word arms control. And there was an agency which the public was trying to disassemble all of the arms control and disarming agencies, you know, the arms control in the government. It is clear that title was a compromise between these two things that people thought of as sort of different roles. It was one, that we wanted to get rid of nuclear devices, we wanted to disarm; the other that we wanted — that the more realistic thing was to bring them under control and there is very kind of arms control measures. But arms control when it started was considered with great suspicion by the people that had been working against nuclear weapons. Came to [inaudible passage] a very good thing, arms control. In any case, after the Cuban Missile crisis, the importance of doing something about nuclear weapons, and one of the things was to push for the Nuclear Test Ban [???]. And the moral I think for many of us as a whole was the fight for the Nuclear Test Ban, I don't know if [???] immediately, was the fact in order to push for the Nuclear Test Ban, and a wide [???], and the emphasis was on fall out, and what we got when the issue to us was not the fall out. The real issue was the nuclear tests, or accelerating the nuclear arm race, and we wanted to stop the nuclear test so we could stop the nuclear arms race and we had forgotten that would stop the fall out and the Soviet arms testing and the [???].

Catt:
Sure, and this was enough about the Administration's policy of MAD (mutually-assured destruction), which they say, well, the only way we are going to ensure peace is to have so many weapons that people would be afraid to attack us. And this going directly against the then policy — the government's policy regarding this issue of should build more weapons, should we stay where we're at, or should we get rid of them.

Wolfenstein:
Well, the question was whether as the real issue was an assumption of arms control, whether one could control was going to go on both sides, and a test ban was a very clever way to stop the arms on both sides. [???] on a side of [???]. But it is major — I cannot emphasize that enough, in the — there was the GAC (General Advisory Committee) in 1950 that advised against the hydrogen bomb, that unanimous vote of these physicists. And they pointed out [inaudible] was here that you if you could have a test, you can tell if the other side is building a bomb, then we have to test it. So that it implies that if you agreed not to have a hydrogen bomb by doing the test ban that would sort of self-enforced. And that of course was the idea of the test ban. If you could hold down the nuclear arms race on both sides, [inaudible] because they always thought that they were winning.

Catt:
This issue really brings out the play in responsibility or the political role of scientists that they can affect policy. And that came out in the Cuban Missile crisis, here scientists and physicists say, "Wow, gee things are really starting to unravel here. We've got a policy that says we need more weapons and we need to test them, and now we come to this brink of disaster. What should we — what can we do about this?"

Wolfenstein:
Yeah, well, we can talk about that. But scientists did do — and again it was not a radical scientist but again a scientist that sort of fit in the middle. And there was the arms control again. See once again, the distinction here of the sort of radical [inaudible] and those who were sort of are [inaudible]. What you have to do is really analyze in great detail how you can get measures of arms control that are mutually verifiable, the question of verifiable by national technical means became a very important thing. Those ideas weren't known by scientists through workshops and [???] study groups. But these are scientists not of a more radical [???], but somewhat more established types who [???] were working on this arms control as some way of getting some things that were testable, but the big thing being pushed in was the test ban, which for various political reasons got to be the limited test ban, which really didn't do anything to stop the arms race and to stop the politics.

Catt:
Considering the arms politics, at this time I assume you are still embracing them from the socialists' perspective?

Wolfenstein:
Yeah, pretty much, pretty much. I always have a socialist perspective.

Catt:

Were you looking at this in the relationship of sciences and society? And I am trying to get at how [inaudible] consciousness was really starting to —

Wolfenstein:
How it related to a socialist's perspective. I don't know how closely related it is to that. Or these issues seem more almost more transcend that. The nuclear — I mean in a way, although there are some in the nuclear arms issue of the nuclear arms race and the Cold War, but there are some motivations that you can trace to the [???] system. It is probably true that it was more just policy — I mean I don't feel that the nuclear arms race had a particular capitalist motivation. It belonged to another category of things.

Catt:
Okay, how about the issue of civil rights that started up —

Wolfenstein:
Civil rights, yeah, I never was, you know, I never — it wasn't sort of an issue, in the way I spent a lot of efforts. My concerns [???] and my personal activities were focused on nuclear weapons issues.

Catt:
What were your reactions to Castro's revolution —

Wolfenstein:
Castro in Cuba — I guess the concerns — I don't know, I try to think of how much concern I had before the Cuban missile crisis. It showed how dangerous our policy was. I think all of us felt the government that had been in Cuba sort of like a U.S. colony and that they were very justified to get rid of (and I forget the bad man's name), Fidel Castro kicked out. [Inaudible] or whoever had Cuba before that, and you know that was a good thing to have a revolution there. And then the whole [???] I think, again I don't know how much is retrospective and contemporary, that the U.S. policy rejected it so. We had thought that had been rejected because we wanted to hold on to our colonies. That was in fact forcing Castro to be more extreme. So I thought the U.S. policy was all wrong toward Castro. And in time, then it proved itself to be wrong.

Catt:
And another, I wouldn't say colony, that wouldn't be correct, but then Vietnam in '65.

Wolfenstein:
But then Vietnam was a big issue for everybody. Again, the issue for many the issue was the tentative surface and worry about the most was that it lent itself escalation. And so that was a concern because it turned out that [???] weapons was this whole thing could escalate. And so the first thing was beside the fact of [inaudible passage. It had been a colony for a long, long time in France, and now we were in control of the government and so forth and so forth. So, people were against the war. And the thing was that [inaudible] pursue this narrow thing about avoided escalation to the [???] to this totally immoral thing.

Catt:

Involved in a more specific question for scientists for Vietnam is that you start to see the direction of the application of science, and it was just technology and other would say we start using the electric fence we were thinking about putting up. The use of high tech weaponry and use of chemical agents biologically. Scientist really start to see that perhaps there is some connection coming from students and from other avenues, and perspectives people were starting to say hey scientist you have a stake in this too. There are a lot of social institutions that are being questioned at this time. Obviously the government is the biggest one, but then from that any one directly tied to political science because of the funding issue coming from the '50s and '60s.

Wolfenstein:

Well, yeah, one issue [???] maybe first of all came out through a job for the students again. They were sort of getting jobs in the defense industry, and a lot of it was space, which was separate from the other. So there was I think a concern, yeah, about between these two going into being involved in this kind of application. That is one kind of concern. I mean, there is a general concern about scientists being misused in various ways.

Catt:

And there is also the issue of secret research, and I guess that is the big fuss about military search on campus — is this the place —

Wolfenstein:

Well, there is a whole question, yeah. I try to remember I mean I got involved very much with finding much later in the '80s called SEI (Software Engineering Institute), that big building on 5th avenue there that is MCU or Applied and was awarded [???] that really was a Defense Department research institute. And as the leader in opposition to it, I thought we shouldn't do that, that we should [???] the university. [???] Defense Department facility there. They claimed all that they didn't do classified research, and I sort of was not clear of rather how true that was and what it meant. People had to have classified information there, and some of the people who worked there had classified information to use in order to do their own research, which wasn't really classified for some reason. In some respect, I remember this conversation came up before about secret research on campus, specifically in some other instances. I don't know there were occasionally issues about also and it's true about having a declaratory policy about that, about doing classified research on campus. But I don't remember whether there was an issue that actually existed in the sense there was classified research going on on campus. [Inaudible]

Catt:

Well one thing that you do get involved in is (this is a letter from Dan Bolef) and in reading it it looks like you sent this out to a bunch of other colleagues about courses on science and society.

Wolfenstein:

Oh, it was clearly another issue. But when was this? How this was 1967.

Catt:

So we are jumping a little bit ahead here.

Wolfenstein:
Oh, yeah. Oh this is mine? I typed it. Ah, this was one of the first ones I gave. [???] the syllabus. Seems you know a lot more about me than I do. Seminar in Contemporary Ideas. This may be in the —

Catt:
I'm just interested in the background of this, because this is indicative of a train more scientists are now starting to look at that connection. I mean you have books, Thomas Kuhn's book the Structure of Scientific Revolution that come out and say, well, science is the link to society changes a certain way, but it doesn't go far enough in some cases. You were starting to get critics form students at this time on scientists for issues of military research on campus connected with issues of ROTC, all these anti-war — and this is one way scientists start to become active, if you will. Is to start taking over courses like this.

Wolfenstein:
Is having courses that [inaudible].

Catt:
Geared toward a non-science saying this is what we do.

Wolfenstein:
Well, actually —

Catt:
And actually you were one of the first ones that I have come across to offer a course on science in society.

Wolfenstein:
The — this was I think [inaudible sentence]. All right, I gave courses and intended to leave shortly afterwards. So yeah, those courses were great a variety of form. That was done, it fit into various categories. I think it was some kind of somebody had entered this seminar probably, having some special seminar so people could extend this. And so [inaudible] acting in the history of science at the time, a man named Harold Burstein.

Catt:
Can you spell his last name?

Wolfenstein:
B-U-R-S-T-E-I-N. He left shortly afterwards. And he worked for quite a while as a historian as U. S. Geological survey. And I lost track of him. Anyway. Well, I knew him and talked to him and realized that this course. And since then off and on I have given courses, given usually all of them having something with atomic weapons because nuclear weapons was something that people were particularly concerned about. So I don't know at the time how many courses were being given and how many scientists were joined with other people and were inquiring about it as so powerful. I can't remember what answers I received. Of course, it became much more common and a whole lots of books on it. [???] of people do it in different ways. Some people do it much more from a science point of view, and many books have been written on that.

Catt:
On the physics point of view.

Wolfenstein:
So that's different. That's physics book. So that's a physics policy. There is one that sort of a sort of a physics oriented one, I forget the name, in North Carolina that I used that had sort had the science together with the nuclear weapons issue. But there are quite a number of books. But at that time there was, we didn't have a book, so we used sources of articles and literature of that kind of material. Anyway, I have done it off and on for many years in many different forms. I had a colleague [???] Bob March [???] and Sergio DeBenedetti, who started to give a course on science in society in the physics department. That course was given as a senior seminar, and he of course on science in society. And that one I eventually took over and made it much more a nuclear weapons type of course on the nuclear era. And then about 15 years ago there was the university [???] that we should have interdisciplinary courses, and so then I entered it into the courses jointly with somebody from humanities [???]. I had done that off and on for quite a number of years.

Catt:
How did you either your chair, or the university or the departments or college, react to this proposal at that time? Because it is experimental.

Wolfenstein:
At that time, I'm trying to remember how I fit in into teaching [inaudible]. You know, I certainly taught some regular physics course at the same time is my I guess. I don't know. So whether I actually did it as an extra thing, not in the regular physics course, I don't remember. On the other hand it was a time when we already probably some university move more into this seminar for seniors so I think I didn't fit into a university category.

Catt:
But yet, it's hard when you get in an organization like FAS to separate the two.

Wolfenstein:
Well, that's right.

Catt:
For a radical scientists there wasn't a separation. As a scientist, you can't say I'm a scientist and a citizen, that's silly. That there's the whole, so you shouldn't be involved in politics. And around whatever issues and groups like the FAS are only misleading themselves when they say okay, we want to engage in politics, but only on certain terms, and those terms being that we are going to be coming up with a very scientific standpoint and we are going to say we are going up on certain issues, and when we attack these issues it will be with data that any scientist can present. Almost using the scientific method. And for some radicals that was —

Wolfenstein:
Well no. It was it was distinguished between —

Catt:

I mean it gets a little slippery.

Wolfenstein:

Let me say, yeah, there are three things. There was the point of view of the APS, which was they can make a scientific study of say Star Wars, in which they define certain questions and then discuss what are the possibilities that lasers can be used [inaudible]. So that they considered a truly scientific study. And in fact at the end of that study of that example maybe there is something, some issue, I forget who's, so summarizing in a way that seemed too political and there was a big objective. But the study itself was the same like that. That's not what the — I mean the FAS does that somewhat, but it's not really what they claim to do. They claimed to show you what they did in the past, some [???] when we didn't make these detailed studies, like the APS tried to do. Rather it said this is a issue which as scientists we have something more to say to other people because we have some deeper insights into the problems. And so it's a political statement, to realize it's political I think because of the relationship. But you know, we do as scientists. Otherwise we join some other organization. [???] nuclear policy committee doesn't [???] that scientists. That's an organization of many people, and we have our generally made statements and have tried to defend them. But we don't say we do this because we are scientists. But if you as a scientist want to limit yourself to a set of issues that seem not to be scientific issues, not to be issues that could really be solved by scientific method, but issues where scientists would have a special insight. How they know something about nuclear weapons, they know about some of the dangers it represents. They're aware of the escalations that go on, aware of some of the potentialities in the future if you don't solve it now and so forth. But some kind of way greater insight into some of the problems, that is the problem they ought to attack.

Catt:

And the FAS has been very successful in a lot of cases. One perhaps that we are seeing now is Matthew Meselson back in the late '60s starts to bock at chemical weapons, and is considered an insider and is able to affect change from there. So some say as theoretical scientists should have to be outside of established institutions, and that's what you do as a radical. Well, perhaps not, and that's what comes to a scientists you can work within those and you can change from within. Brian Schwartz is one that advocated that position.

Wolfenstein:

I didn't know anything from within. You mean what?

Catt:

Like to change the APS, the best way to do it is not to go outside and form an organization, it is to —

Wolfenstein:

Well, oh the "insider-outsider" issue is I guess is more of the question of inside. The government the "insider-outsider" issue, that that's the "insider-outsider" issue APS I guess.

Catt:

And another issue that I just want to talk about is this little piece here is on the Mansfield Amendment of 1970.

Wolfenstein:
Mansfield — I don't remember that. The famous Mansfield Amendment. Where did you get this from?

Catt:
I think I got a copy of that from Dan Bolef.

Wolfenstein:
From Dan, yes.

Catt:
If you don't have a copy, I can definitely get a copy made for you. At the end of the '60s money is being withdrawn from science to go to Vietnam. Also, the space program started to wind down, so money being pumped into science is drying up. Correspondingly, you start to have less jobs, which is going to get into the early '70s unemployment crisis, in physics especially. But there is also this there is a lot of abuse fraudulently of government money, specifically DOD money and basic research. And so that is your little piece about that.

Wolfenstein:
I don't know what we did about that. I guess the Mansfield Amendment [inaudible] interested in trying to.

Catt:
Did you think, was it a good effort?

Wolfenstein:
What, the Mansfield Amendment? Oh yeah, [inaudible] of not having basic research was the whole idea. That the National Science foundation should be something about science, to important science, and not [???]. And there were two problems about the military. One was is was not a very reliable basis for doing research, research that was done [???] of what's important for making scientific discovery, and the military control is [???] control [inaudible] scientist. That was one thing. The other thing is in the Oval Office of the military and the campus was a concern about this [inaudible] campaign against the ROTC on campus, that the role, certainly at this time, was [???] one of those kind of effect on campus was not is explicit. Implicit, you know, meaning you have money from the military and that your control, and then that control has an influence on the [???] on the campus with military influence [inaudible]. The issue now is that of course this can affect any government [???], is the issue that if you stay in the ROTC on campus they take all of your contacts away. That is a very [???] issue [???].

Catt:
Well another issue that we are seeing now that has come up directly because of the Mansfield Amendment is the Department of Science and the cabinet position. What were your thoughts?

Wolfenstein:
All that's been discussed now and then…

Catt:

Okay, ever since the nineteenth century.

Wolfenstein:
… about the Department of Science. One of my positions is that opposed to the military support for basic research, I often thought that pluralism is not a bad thing. One of the problems in the Department of Science, and [???] even the National Science Foundation to worry about is here is an organization that sort of is controlling science. Now the way it operates in the whole thing is good. I mean the system we have in the Science Foundation, this peer review system is remarkable system. In fact I even did an article, I never published it, on why the peer review system is a model for the socialist organizations. It appears the socialist institution, even the Republicans and [???] and Reagan is very strong on basic research being done by the government. Because there was a long time of government affinity that even the Reagan people approved of because it was something that they knows these people would do. So the whole question is how do you get government to do things without having this problem of the lack of freedom and government control. And the whole way the NSF operates is the model for that. But the one thing, additional thing that is useful is to have some pluralism, so that if there is some whole category of things that somehow they won't approve, there is some [???]. And in sense there is [???], even within the government, that really could apply [???] NSF [???] Department of Energy, if you didn't get it with NSF you could go to NIH, and to a couple of places before the military to get money from. So I felt the pluralism I felt is good, and unified [inaudible].

Catt:
That increases the bureaucracy which —

Wolfenstein:
I don't know if it increases it. It may increase bureaucracy. That is enough. I don't know about that to increase the bureaucracy.

Catt:
But maybe not increase it, but it's the policy.

Wolfenstein:
The idea was that you [inaudible]. But as I said, the pluralism has an effect.

Catt:
Do you think scientists then (then being like the '60s and early '70s) or now have a special role or special responsibility to society? I know we talked about it. Note: Interviewer indicating "Statement by Lincoln Wolfenstein, Professor of Physics, Carnegie-Mellon University, on behalf of the Pittsburgh Chapter of the Federation of American Scientists, to Citizen-Congressional Consultation in Pittsburgh on June 20, 1969."

Wolfenstein:
Yeah, we talked about it already, I think the answer is yes, obviously. I think they have a responsibility — because science has such a big effect on society they have a responsibility both group wise just a personal responsibility to a lot of science you ought to be responsible of what happens. You know, how science is used. And also more explicitly in terms of well you have

some scientific test procedure that helps you have a more informative opinion of some of this, and you ought to try to have that have an influence, particularly when you consider that however many people 400 or 500 that you have in Congress are almost all scientifically illiterate. So you have — that is a responsibility. Ideal. Since it is a very ingenuous statement I remember that Edward Keller would make that was totally generous and totally opposite of what he does but who he would claim opposing the FAS. What you should — all you should do is tell them, you know, all you relative scientist tells [???] the scientific facts, and then it's up to the politicians to make the decision. That is the exact opposite of what he did. He claimed that opposing groups had political goals. No, I think that do have a responsibility, both for the sake of doing science, be responsible of how it is used, and because they have insights.

Catt:
Do you during this time or do you now convey that message to your students?

Wolfenstein:
Convey it to the students? That's a good question.

Catt:
Because it could be your responsibility that you shouldn't have to —

Wolfenstein:
Whether I convey it to students is, I don't know. I mean I convey it for the students in the courses, which in I have done for many years in nuclear weapons policy. That is certainly conveyed to students in that way. And the I don't know whether I conveyed it to the students if I am teaching them quantum mechanics, if I can convey it to them. Rather interestingly, there is a course, I guess it is a course hour a week, that the Department organizes called Colloquium for Undergraduate students, and we [???] a variety of things in the form of what's going on in physics in forms of job opportunities, and I was asked by the professor who teaches it to talk about this issue social responsibilities of scientists, activities and so forth [inaudible].

Catt:
I would have liked to have heard that. Within the humanities and the science study fields, within the past decade or two, actually since the '70s, a movement called Social Construction of Scientific Knowledge.

Wolfenstein:
Social Construction of Scientific Knowledge?

Catt:
This notion that —

Wolfenstein:
The constructionists?

Catt:
It's part of it. It gets —

Wolfenstein:
It's not that (Alan) Sokal Affair, is it?

Catt:
Oh, well that's on one separate — that's on a different trajectory. It has it's roots in this. I guess it could be objectivity of scientists that say that there is a noble nature out there, and we have techniques to go out and make claims about this is a weak current in the interaction, which I incidentally was reading about in this book. I'll show it to you more.

Wolfenstein:
(Peter) Galison's "How Experiments End".

Catt:
Yes.

Wolfenstein:
That's an interesting idea.

Catt:
But it says that you can go out and do an experiment or app or theory, but yet it takes a communal sense or societal sense to agree upon yes we are going to accept this as a fact — this is going to get published in physics text books for the next generation and that there isn't knowledge and there isn't object or objective knowable nature out there that things are constructed. If you look at the history of science it changes what we believe now probably in fifty years, theories will come along and say well no that's not —

Wolfenstein:
Yeah. Okay, I see.

Catt:
I'm just interested in your view.

Wolfenstein:
Yeah, I have very strong views on it.

Catt:
More philosophy here.

Wolfenstein:
No, that's right I have very strong views about it. They talk about that too because I thought that in some courses I taught from Thomas Kuhn book but that related to that.

Catt:
That's probably the start of this whole deal.

Wolfenstein:
It is another interesting book. By men Ziman (Z-I-M-A-N).

Catt:
At Cambridge.

Wolfenstein:
Yes. And he's written a book…

Catt:
John.

Wolfenstein:
Yeah, John Ziman. And there is a book, quite nice book, Public Knowledge it is called, it is quite a nice book. Due fact, too. And so as an issue, I believe very strongly there is a real world out there, and that is what we are finding out. Finding [inaudible] He gave a talk actually, a view of a book by Steven Weinberg, and this book goes with Ziman's theory as well.

Catt:
"Search for the Ultimate Question".

Wolfenstein:
Yes. Something like that, something like that. Anyway, it is very funny because he has a chapter called Against Philosophy, which means against all of these, well the whole book is about philosophy of science. Against philosophy and other of such. Anyway, here's for these items, what we are doing, we are looking out at nature, trying to understand it and define a government. Laws that govern. Not too eventually make some tentative ideas. It's a collective effort. Not that one person does it all, it is a collected effort. And eventually enough evidence accrues that it becomes accepted by the scientific community, and accepted because the evidence is so strong that the description that the information. So that I believe it. Very strongly I believe in the real laws that govern nature. The other thing, and it is a missing point in Tom Kuhn — the thing that Tom Kuhn [???] that the scientific revolution [???] try to teach in the course, I tried to teach in the course with [???] students, it's called the Correspondence Principle. But in a very general sense. General correspondence theory. The Correspondence Principle in its narrow sense, defined by Bohr for as a fact, is the correspondence between quantum mechanics and classical mechanics when your distances are not too small. And that ever since I think before Newton's time, all the real scientists, because we don't throw away the old ideas once they are established. It is so well proven that the new theory and the old theory has to be related to the new backbone. [Inaudible] something totally different and totally [???]. There is a tendency to miss the point of the correspondence principle in the fact that it was not to about pre-scientific science. That is not particularly true about some of the things before Newton's time. But nearly all of the physics from Newton's time [???] real evidence, a clear preponderance of correspondence of evidence points to some theoretical concept, idea, law, [???] in the [???] of law by [???] perhaps superceded by a more general law which has a correspondence principle. So I think, yeah, I don't believe in the idea that science is a social construct against philosophy in the sense Steven Weinberg did.

Catt:
So what are the truth allowed in science that enough people interested in a theory and a problem that amongst them, they are not all going to be staying back at the same.

Wolfenstein:
That's right.

Catt:
It's always that science is an evolving process.

Wolfenstein:
The idea is not necessarily a popular philosophy.

Catt:
Okay, I was going to ask you —

Wolfenstein:
It was [inaudible]

Catt:
One of my committee members is a philosopher of science. I won't make any comment. What books did you read, can you recall from the period to the early '60s that influenced the way you think about science?

Wolfenstein:
Books that I think about science?

Catt:
Of the way you view the science society relationship. Kuhn you've mentioned.

Wolfenstein:
Kuhn.

Catt:
Or I was thinking Karl Marx would be another.

Wolfenstein:
No, no, [inaudible] early on. [???] Karl Marx. I am trying to think if I can think of things that influence me that I think that I told some of my students to read. I mean there's Kuhn I found some very nice things in Kuhn's book.

Catt:
Max Bohr is another one, the physicists.

Wolfenstein:
Bohr is [inaudible]. [Inaudible passage].

Catt:
Do you believe that? This is beside the point.

Wolfenstein:

Beside the point, [???] the two cultures, there is something [inaudible passage] interesting issues.

Catt:
Tie back in with the Sokal article and that's kind of what he's getting at, that you have scientists with an esoteric vocabulary, then you have those studying science that have just as an esoteric of vocabulary. And so if you can just mix up the right words and add them right in you may be saying something that is gobbledygook, but people will say this is important. And then so you get this thing called a hoax. But what he's getting it is that hey, we what we have is two different communities and we really aren't not communicating.

Wolfenstein:
They are not communicating, that's for sure.

Catt:
So you have the science wars going on right now. Flight from reason.

Wolfenstein:
[???] in the university. I'm trying to think if there are other things that I read… think, think. If I go back, Herbert…

Catt:
Marcuse?

Wolfenstein:
I never read that [???].

Catt:
I was thinking Karl Popper, Feyerabend. There are philosophers.

Wolfenstein:
Yeah, I never get I never cared much about these people. I found Kuhn interesting, and what you call sort of the local guy who is a local report, that sort of thing. Larry Lauden, I know his stuff [inaudible]. He as active then. And I think [???] so much. I try to think, [???] scientists.

Catt:
Oppenheimer?

Wolfenstein:
Oppenheimer never really wrote much. He wrote some very general papers, but I'm trying to think if there are one's who wrote, you know, in terms of [???].

Catt:
I remember Szilard wrote a piece. It started off the Council for a Livable World. It I was in the early '60s.

Wolfenstein:

Well, yeah, in terms of some — I mean that is a more political sort of thing. So Arendt, she wrote the thing that started what was really called Council for a Livable World, it was called the Council to Abolish War, or something. Originally [???] peace.

Catt:
Linus Pauling's "No More War" was [???].

Wolfenstein:
Yeah. It was a lot of it was political things that were studied. I am think that they were books that [???] books that I used in that course that was about nuclear weapons. I used a book — in your book Light in a Thousand Suns, I, it was very controversial. And I don't remember when I first used it in a course either. I don't know when that was, it was a long time ago.

Catt:
I know you were using '67.

Wolfenstein:
I used it in, I put it in in '67. And when I first used it in the course — I don't know if I taught much before that even, I may have — I used to hand out a set of reviews of it, they were published in some… in fact —

Catt:
Yeah, the reviews by Condon, Bethe, Wilson. Bethe is a famous review because the first time Begsteins is ever used, by the way.

Wolfenstein:
Oh really? Oh, I refer to the [???]. I have heard of those reviews. [???] Condon and Bethe and [???] got out of some actually —

Catt:
Bethe's was in the bulletin.

Wolfenstein:
Bethe's was in the bulletin yes. Other replies, or they may have come in the book. I think I had them in some other source. And all of the reviews are very critical of Jung. And they are all by very good people. They are interesting, they are all very excellent people. And they are all critical. Actually, Bethe is the most moderate I think. I can't remember about Bob Wilson. And only critical because there is an implication of that German's scientists were more ethical than the American scientists, just a little bit of that, and that sort of thing got everyone very angry. But it is a nice book and it gives a kind of — of all the — you know, it is better than anything I believe because years of sort of back ground and it starts with a little less — You know, it's not like Rose or other books that tries to be you know very authoritative about its references and so forth. It tries to get the spirit of the scientists before the '30s you know, it gives a wonderful picture of everything and gives the scientists before the '30s how wonderful they are and everything is.

Catt:

Internationalism.

Wolfenstein:
Really gives a tragic sense of what happened. And so I know it is sort of eerie whether the book that or the interest for many books about the bomb. An interesting book I used once in a course — it didn't go over at all — and I used at the end of a course I gave, I don't think I did this one. I used Eickman, and what is it called? It is Hannah Arendt's book, Eickman in Jerusalem. And it's a wonderful phrase, the something — and it didn't go over with the kids at all, too close to the end of the course and they can't. And they the theme is famous and the whole point was that Eickman said he was just doing his duty. And you know —

Catt:
I'm not responsible.

Wolfenstein:
And you know, and that does have something to do with the scientists, you see. So there…and the finality of evil. Famous phrase. So I tried that in a course that I was very impressed by him and henceforth. But it didn't go over well. I tried that.

Catt:
Okay. Okay. If I were to ask you it characteristics or attributes of a radical scientists or of a radical physicists, or would generally radical scientists during this period, how would you define —

Wolfenstein:
I'm not sure what you want to say. If you want to know what made people that way or what they did, I'm not sure. The way radically they were…?

Catt:
In literature you see people being claims either being labeled or self-prevalent or those radicals some were radical, whatever. But when it comes to radical scientists, what would that mean to you?

Wolfenstein:
Well, I don't know. I mean I guess, you've got…

Catt:
Perhaps give it in the context of science people.

Wolfenstein:
What if I think of radical scientist, I think of Charlie Schwartz, I guess.

Catt:
Or I was thinking of another Pierre Noyes as somebody you may know.

Wolfenstein:
Pierre is crazy. He's a mess. But he doesn't [inaudible]. I just bumped into him in the hall at

SLAC, and I get the feeling that he must be under medication because, I mean the last time that I had been there I just got this — well I did get a bit of an outpouring of something crazy, but he wasn't as crazy as usual, and it wasn't an outpouring as usual. Anyway, I think he has lots his mind. So he didn't come — I don't remember from the '60s anymore. But in case someone like Charlie Schwarz as an example, there is someone who — and that's the kind of radical who sort of doesn't — who wants to be specifically defiant of sort of the norm, like saying the students should swear not to make weapons before they can go to this class, or you know, jumping up and down [inaudible]. So sort of that kind of radical scientist, but that may be the extreme. It almost has been defined as a sort of certain kind of personality perhaps rather than views.

Catt:
Right.

Wolfenstein:
So that so that I guess the other thing that someone who is, you know, of those people who are sufficiently persistent in voicing their views which are more radical views that they get known for it. I am trying to think of other people who fit this example.

Catt:
Did I send you a list of people I had interviewed?

Wolfenstein:
Yeah, I don't know if you sent — you may have sent me a list, I know you told me about quite a number of people.

Catt:
I had been some rattling off some name of a list that I had interviewed and see if that would help. Stan, of course.

Wolfenstein:
Stan is yeah. Stan is well the other thing is that if I think of a physicists I tend to think of those — yeah, okay. That I knew very well that I knew in the Westinghouse, but go ahead.

Catt:
Martin Perl.

Wolfenstein:
Marty I knew, and Marty — One of the issues is to what extent is scientists — sort of I guess one issue of radical scientist is to be what extent he is radical of sort of helps to define his career. Now Marty's career is defined, you know, he sort of speaks out, but [???] defined his career, got his Nobel prize. But this I guess one of the aspect of radical is maybe a tone of voice, or way of speaking. Marty has come from New York.

Catt:
Many of them do. Brian Schwartz.

Wolfenstein:

Brian Schwartz, that's right. He ends up being a sort of AVS officer, right? He does now, so he doesn't — Go ahead.

Catt:
Michael Goldhaber.

Wolfenstein:
Michael Goldhaber is an example now of one — that's another type, one who leaves an establishment completely. And so there are those who basically abandon an established career and I don't know what he does now. I think he has a book.

Catt:
Right, he's working on a book — Inventing technology.

Wolfenstein:
Technology, that's right.

Catt:
Right and he's working on the book, which is the [???] of economics.

Wolfenstein:
So that is sort of beyond the theory to have a postdocs at SLAC, a man named David Greenberg, who become an authority on physics. So that's another category, those who leave the establishment.

Catt:
Mike Casper

Wolfenstein:
Mike Casper [???], he is someone who has now of course put a lot of effort into things like physics education. That's another direction some of the staff have taken. Some people are gone. [???] radical in physic education. I guess one of the things that one can mark is I'm a radical scientist, and that counts is that you put not only do you speak out but you put a certain amount of your academic effort (by academic [???] people that are [???], meaning [???]), you put a lot of your academic effort into that. A fair amount of what I have been teaching over the last fifteen years is of course about nuclear weapons. Now that's party a little unfair because the because for the last fifteen years I have been [???] I have been able to teach whatever I want to.

Catt:
And to that perhaps would fit best modality of a radical would be Marc Ross in Michigan.

Wolfenstein:
Marc is an example — he is a great example of a radical scientist, because he is somebody who, I mean is a fairly competent physicist, he speaks his piece in a way that is sort of a quite non-conforming way, and he has devoted of course a lot of his effort into — in fact I think he very much abandoned theoretical physics and other things. I don't know how he does them. I don't

know what he does these days.

Catt:
Environmentalist.

Wolfenstein:
Environmentalist — particularly in environmental things. And so he is a very good example. Do you know Art Rosenfeld?

Catt:
I heard about him.

Wolfenstein:
Because he was very much active in physics and then he was active in FAS, and then he went into speaking to environmental area.

Catt:
And someone who is FAS, Lenny Rodberg.

Wolfenstein:
Lenny Rodberg, yes. It was very interesting. We were debating in — well it came to who was going to take over FAS when he started to go in office. I think the competition was between Jerry Stone and Larry Rodberg, and for various reasons chose Jeromy.

Catt:
And this was back in the '60s?

Wolfenstein:
'60s and '70s. '69. And yeah, and Lenny was really more radical, more radical than Jeromy. I haven't followed him, I don't know what he does.

Catt:
He was at the Institute for Policy Studies for many, many years I think he may be there. He was a Maryland for a while.

Wolfenstein:
I guess that IBS stuff, I don't know. [Inaudible]

Catt:
Bob March is another one.

Wolfenstein:
Bob March is another one, yeah. Yeah, there is a certain — you have a certain I guess one character is a certain, let me think, non-conforming way of talking almost. There is a certain non-conformist speech. You pick up like Marc Rosdeon and Charlie Schwarz and Bob March, even Marty Perl. They sort of, you know — With Marty it is funny, and it is part BS. All the things are almost like speed talk [???]. So a little of that certain manner that sort of goes with

some of them, and with Bob March too. And again, some of them, you know in his case, sort of a big effort to popularize the science. So I guess it is partly that distinguishes some of what you think of is may be radical is the sense that they diverted — I mean those who have completely diverted and gone into an environment and so see well you know they changed fields almost. So I think the ones that are more called as radical physicists are the ones that continue more or less in their academic careers, but put more of their emphasis in their academic career into efforts that feel a significance.

Catt:
Maurice Bazin.

Wolfenstein:
Don't know him.

Catt:
Don't know him, okay. Bill Davidon.

Wolfenstein:
I don't know him.

Catt:
Stuart Hammerford [?]

Wolfenstein:
Stuart Hammerford. Yeah, that's an interesting case. I mean again, I think he is an old timer.

Catt:
This is not so much active in ATS matters.

Wolfenstein:
Oh, no. I mean he's a first I mean, he's always been I think a Quaker. I think it is Quaker. His activity [???]has been a lot in things like the [???] and walking the fence point of view. And then the other thing of course that distinguishes him from the people in my category is that they don't think really so much about physics research. And for a long, long time — I guess he did one for a long time. I don't [inaudible] physics research. And of course there's a lot of good research academically, by [???] people. But less emphasized in the teaching of students.

Catt:
One observation that many of the people of the names we have thrown out got their degrees from Chicago.

Wolfenstein:
There is evidence about it, yeah.

Catt:
That's something that is identifying groups.

Wolfenstein:
Identifying groups, yes.

Catt:
Where they go to school. You know.

Wolfenstein:
Yeah, well, one of them from Chicago is Jay Orear.

Catt:
Which I was just getting ready to ask you about him. I have had different takes on him.

Wolfenstein:
Jay, I know Jay. I've know Jay a long, long time. And because he remains active. We even wrote some an article together.

Catt:
Is he still at Cornell?

Wolfenstein:
He's still at Cornell. He was the last time I was — I think he is still at Cornell. I'm trying to think when I saw him the last time he was at Cornell. I had seen him at a meeting the time before. I went to and they had a meeting that he helped organized I went to and then I gave a topic for Cornell, when I'm not sure. But anyway, we were there recently, I think he's still at Cornell. And well, Jay has always been very outspoken, and always speaks so well. We worked on a [???] concern together. [Inaudible] short article in the bulletin: European scientist speak out. I don't know what they spoke about. But anyway, we had something together.

Catt:
Yeah, I remember the physicists in Italy when Gell-Mann was in Paris and was booted out, then he went to —

Wolfenstein:
Oh, yeah. Big campaign against Murray because of IDA I think.

Catt:
Right, against JASON.

Wolfenstein:
This JASON group is an interesting group because they are very, again, for the most part very decent people who want to be insiders and the moderate view [???]. [???] are not great, but they have to accept the premises, so they end up inventing the electric fence, was one of their ideas.

Catt:
Project Igloo was what it was called.

Wolfenstein:
That right? And so they get themselves caught up in this sort of thing. [Inaudible]. Another of my fellow graduate students, Marvin Goldberger, I don't know if you know who he is. [Inaudible].

Catt:
Were you ever asked to join?

Wolfenstein:
They said that a lot of them I think had some — I don't know how they got into it. Most people like Murphy Goldberger are incompetent [inaudible], sort of incompetent. [Inaudible] entrenched. [Inaudible].

Catt:
A French scientist signed a declaration and sent to the United States, saying, "American scientist you should oppose the war in Vietnam." And they had signed this petition.

Wolfenstein:
I don't know.

Catt:
[Inaudible] and a few –- actually Maurice Bazin signed it, and I see it dual appointments with dual appointments of Princeton and [???]. But anyway, this got filtered out because in Paris this is where you want to make contacts with the Vietnamese and print your books and your money, everything there gets there. But this is something that was sent back.

Wolfenstein:
Anyway Jay I know. He's a — So I don't know. I mean he's somebody who has distantly spoken out, and sometimes he seems little naive about what he does.

Catt:
So this amorphous definition that we're —

Wolfenstein:
Of radical science, yeah, yeah! Because he certainly defines — One of the things I guess that defines a radical scientist is someone who, you know, beyond this — who to me, should be somebody who maintains his academic work. He redeems himself as a physicists. But actually in some ways becomes identified not only by his science and his I guess concerns, so he really get identified by that, it becomes a major part of this identity. Not just the casual part of it. That may be partly radical. But partly of course is what his views are, and they have to be in order to be counted as a radical, it has to be radical views also.

Catt:
And it's usually associated with being upon the left?

Wolfenstein:
The issues have to be on the whole on the left, they tend to be a collection of defining issues of

which things about nuclear weapons and have been a major one, Vietnam wars another major one, the military on campus is another one, and then more recently environmental issues. I don't know. I mean, well, again…

Catt:
So I the question I want to ask you now, not that we've defined radical science. As I said earlier before we interviewed, it's something that perhaps maybe escapes being able to pin down. I'm going to try. But a lot of characteristics that we were throwing out — I won't make the snide remark about the craziest view I guess — that's you.

Wolfenstein:
Yeah, that's right.

Catt:
You've stayed true to your physics. You've been active when the issues, you feel strongly about. And you are coming from a left perspective. I mean, getting published in Dissent, which I don't think Ed Teller probably has pieces in Dissent.

Wolfenstein:
Yeah, oh, well, yeah. Back in those times it was very important to get those kinds of articles. No I think so. The one thing that perhaps, you know, feels that distinguishes me a bit although from some of the radical scientists, at least with some there is a certain anti-almost anti-science part of it — that scientists are — something wrong about science is science to an elitist is that scientists shouldn't be doing. The scientists shouldn't be producing more students. There is a little unity with those who are saying there is something wrong with the science activities. And from Marty Perls that we shouldn't be producing so many scientists, or [???]. So this is certain opposition to the scientific elite that you see. You see it in of course some of the younger people who say old scientists should give up their jobs so we can get jobs. Sort of that whole — So that's a certain part of radical science. And the other one is the sort of science for the people that people of science that you should change what you do in science so it should be directed at helping people in science that, you know, if it doesn't have social purpose it shouldn't be done. But I don't know, they are very much [???] science for intellectual purposes.

Catt:
You have the tensions of science as a Americad [?] perceived, that you get to be an elite scientist (if there is such things) by accomplishments, being recognized through this process of peer review.

Wolfenstein:
Yeah.

Catt:
Who gets nominated for prizes, named chairs, things of that nature. Whereas others would say we need to democratize sciences — let's open up the doors, let the minorities like women, doing this and try and get rid of this reward system that science has, because that in itself is self-serving. And you come to tensions about this. Well, okay, let everybody in science, we don't have problems with that, but then who's going to get the grants? There is only so much

money, so who's going to be able to have time at SLAC to run their experiments. Well how do you chose? What criteria are you going to use? So these are questions that from a socialist perspective, you know, how do you if there is only limited resources, how who gets included? Who gets access to this hierarchy. Or if you want to go along with a Mansfield, okay, let's not give all the money to the Harvards and the MITs and the Berkleys. Let's give more money to the University of Southern Texas, let's say. So you are not going to MIT. Is that equitable is that fair to science? How do you resolve these issues?

Wolfenstein:

I don't feel that is such an issue. Like I said, because I feel that exactly and that's why I had this interesting idea that peer review is a great model for socialism. Because exactly the point is how do you have socialism and get things done that should be done? And the answer is you do it by not having these things controlled politically. You have to somehow to force these things so politically, so you do the things that serve the function. The function of science is to just make discoveries. You don't make discovery by giving things to South Texas, you make discoveries by giving them to where people or people who are doing it. And I don't believe in trying to invent black physics. The laws of physics are there to be discovered, and we want to do it? I mean I thought educating more people. I don't believe that we should confuse education because there are too many physicists, or we warn people that they shouldn't come in you know, expecting to get a job that they will have to compete and they will have to do something else. But if they are excited about it, wonderful, we want to excite as many people as we possible about it. But there is no fuss really going on [???] about physics if it is not what you have a capability for or enthusiasm for. So, you know, I don't feel that that's a conflict. I feel that the peer review says a scientist — well, it sounds elitist, and it is in a way. It says people good at science should do science. And that [???] government should support because it is a wonderful thing to discover the laws of the universe, and it's our responsibility both to try to communicate it broadly today, [???] it's one of our responsibilities, right, to inform other people so they can get excited too. And it's an important responsibility also to see that it is not misused in the supply. But I don't think that the idea of that you should dispute it the grant people. There are people who can do physics and people that can't.

Catt:

That becomes the notion that everyone becomes a scientist, you know.

Wolfenstein:

Well, I mean random people become scientists, not everyone really, but you chose the people at random who are able to do a requirement. And that you see as a problem of socialism. The problem with socialism, the whole problem is the fact that it is all governed by a political bureaucracy. It isn't going to work. That's why you have to have a way of having the things where there are public funds and funds are used for public purposes, but the running of it is controlled by the people who know how to do it. And this is why the peer review is such a good model in my book.

Catt:

I need a copy of that, by the way. Do you think that radical scientist affected the way science is being prosecuted today, after this —?

Wolfenstein:
The way science is being prosecuted?

Catt:
I mean that could be that it a civilianized funding and more money going to NSF. It could be the way people think about this issue of social responsibility. In any appreciable way do you think that they —?

Wolfenstein:
That they affect the way science is being done?

Catt:
Yes, '68 and after? What gets researched?

Wolfenstein:
I don't know. I mean in terms of really what's going on in fundamental science, the not particularly. In terms of some of the more political issues, there is scientists radical and not so radical that influence things. Like some of the measures of arms control that have been like having the entry — and so some of the things in arms control, chemical weapons you mentioned, you know, over the years, so that kind of influence will gain, if you want to talk about radical scientists and some that are not so radical who have been involved in influencing government. And it's clear that then some of the radical and not so radical scientist, a lot of stuff about environmental controls and the environmental laws and the various environmental activities that aren't governed by laws have been influenced. So in essence, you asked about the process, what goes on in sort of the inside in science itself. I don't know is a great influence in the function of science that really is an influence particularly, or in the way science operates. I mean, there has been various things, but I don't think that has too much to do with it about of various kinds of attacks on science from time to time. But I don't think that scientists have played as much of a role in that as a radical scientist they don't play much of the role.

Catt:
Okay. We talked about that, we've gone through my list.

Wolfenstein:
Great.

Catt:
So I don't.

Wolfenstein:
It's five o'clock.

Catt:
I was going to say, I don't any further questions. Is there anything else you would like to add?

Wolfenstein:
I think maybe I've said enough.

Catt:
Okay, well, thank you for your time.

Wolfenstein:
Okay.