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# ORIGINAL

## UNITED STATES ATOMIC ENERGY COMMISSION

VOLUME XIII

In the Matter Of:

J. ROBERT OPPENHEIMER

HISTORIAN'S OFFICE INVENTORY CONTROL	
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Place - Washington, D. C.

Date - April 28, 1954

Pages..2332 to 2504.....

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UNITED STATES ATOMIC ENERGY COMMISSION  
PERSONNEL SECURITY BOARD

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In the Matter of :  
J. ROBERT OPPENHEIMER :  
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Room 2022,  
Atomic Energy Commission,  
Building T-3,  
Washington, D. C.  
Wednesday, April 28, 1954.

The above entitled matter came on for hearing,  
pursuant to recess, before the Board, at 9:45 a.m.

PERSONNEL SECURITY BOARD:

MR. GORDON GRAY, Chairman.  
DR. WARD T. EVANS, Member.  
MR. THOMAS A. MORGAN, Member.

PRESENT:

ROGER ROBB, and  
C. A. ROLANDER, JR., Counsel for the Board.

J. ROBERT OPPENHEIMER.  
LLOYD K. GARRISON,  
SAMUEL J. SILVERMAN, and  
ALLAN B. ECKER, Counsel for J. Robert Oppenheimer.  
HERBERT S. MARKS, Co-Counsel for J. Robert Oppenheimer.

I N D E X

<u>Witness</u>	<u>Direct</u>	<u>Cross</u>	<u>Redirect</u>	<u>Recross</u>
ROSCOE CHARLES WILSON	2343	2360	2400	2402
KENNETH SANBORN PITZER	2405	2421	2441	2442
EDWARD TELLER	2444	2492	2503	2503

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P R O C E E D I N G S

MR. GRAY: I should like to read into the record a communication to me from the General Manager with respect to the minutes of August 6, 1947, meeting of the Commission:

"United States Atomic Energy Commission

"Washington 25, D. C.

"Memorandum for Mr. Gordon Gray, Chairman, Personnel Security Board.

"On February 19, 1954, Mr. Mitchell wrote Mr. Garrison referring to a meeting of the Commission on August 6, 1947, at which the question of the continuance of the clearance of Dr. Oppenheimer was considered. I understand Mr. Garrison, as counsel for Dr. Oppenheimer, has now requested the precise text of these minutes.

"The minutes show that at the meeting held on August 6, 1947, Commissioners David E. Lilienthal, Sumner T. Pike, Lewis L. Strauss and W. W. Weymack were present. Following is the full text of that part of the minutes which reflect the action taken regarding Dr. Oppenheimer:

"Mr. Bellsley called the Commission's attention to the fact that the Commission's decision to authorize the clearance of J. R. Oppenheimer, Chairman of the General Advisory Committee, made in February 1947, had not previously been recorded. The Commission directed the Secretary to record the Commission's approval of security clearance in this

case and to note that further reports concerning Dr. Oppenheimer since that date had contained no information which would warrant reconsideration of the Commission's decision."

Signed, "K. D. Nichols, General Manager."

MR. GARRISON: Mr. Chairman, could I look at that again, or could you read the last?

MR. GRAY: There is no reason why you should not look at it. Do you propose to discuss this?

MR. GARRISON: I would like to make a brief comment about it.

MR. GRAY: If it is in the nature of argument on the part of counsel, I don't think this is the appropriate time. This was read into the record pursuant to your request to be read in the record. It was not done earlier because the Commission had to make the decision with respect to the request. At a time when the Board is considering testimony with respect to the matters involved in this memorandum, or at a time when you as counsel are addressing the Board, it would be perfectly appropriate to discuss it, but I don't want the record now to involve a discussion of this particular meeting and the circumstances surrounding it.

MR. GARRISON: Mr. Chairman, there is a statement in this memorandum about myself to which I would like to respond at this point of time, and I can scarcely respond to it

without a little discussion. I believe this is the time to do it, and it won't take long.

MR. GRAY: I take it you are not now wishing to discuss the matter involved in the memorandum, but some reference to you in the memorandum?

MR. GARRISON: Yes, but they are intertwined. Perhaps I could tell you what I have in my mind, and you can steep me if you wish me to go no further.

MR. GRAY: All right.

MR. GARRISON: I will begin by saying this, that I am sure Mr. Mitchell will remember a conference which Mr. Marks and I had with Mr. Mitchell and General Nichols, I think around the 12th of February, or the 13th, at which we brought with us a list of documentary material -- items of documentary material -- which we believed would be relevant to the proceeding here for the Commission to make available to us and be helpful to the Board.

Mr. Marks had a typewritten list which was left with counsel as I recall. I had a handwritten short list of which I have the original with me, but in it was explicitly contained a request for the minutes of the Atomic Energy Commission meetings relating to the clearance of Dr. Oppenheimer in 1947, and a request for all pertinent documents having to do with that whole matter.

Mr. Mitchell and General Nichols said that they would

take these matters under advisement and would notify me how much of the documentary material that we asked for could be made available.

The next thing that I heard of that was the letter from General Nichols of February 19, which contained the stipulation -- letter from Mr. Mitchell, addressed to me, and saying, "This will confirm our telephone conversation of today. The Commission will be prepared to stipulate as follows for purposes of the hearing:

"On August 6, 1947, the Commission recorded clearance of Dr. J. Robert Oppenheimer, which it noted had been authorized in February 1947.

"Furthermore, Dr. Oppenheimer will be given an opportunity to read the minutes of the GAC meeting of October, 1949," --

We had asked that they be made available in some summarized form.

" -- by coming to the Commission's offices for his convenience. Arrangements for this purpose may be made with Mr. Nichols.

"Sincerely yours."

I am sure also Mr. Mitchell will recall the telephone conversation referred to in that letter in which he explained to me that our request for documentary materials had all been declined -- every one of them -- and the only information of a documentary character which we could have relating to

documentary material relating to the actions of the Commission in 1947 was this one stipulation.

I expressed a natural disappointment, but we didn't have any argument about it. But that is the way it was left.

The situation then is that back in the middle of February, I did ask for these minutes. They were denied. I was given a stipulation which I think the record here will show was misleading because even yourself, Mr. Chairman, in these proceedings a little while back quite doubted whether there had actually been any clearance.

MR. GRAY: I would say for the record that I still feel that there is very considerable mystery about it. I don't want to get into an argument about it now, but I don't want to leave the impression that what we have now read into the record clears up my mind on it.

Let me say on this matter that the situation now is, and the record of this proceeding will show, that in the course of the conduct of these proceedings, and in the context of matters before this Board, you requested the inclusion of the full minutes in the record. Counsel for the Board and the Board then asked the Commission to consider whether they would depart from what I understand to be policy in the Commission with respect to minutes, and would furnish the actual transcript of the minutes of that meeting, and that has now been done. I don't want to interrupt whatever you are



saying about it.

MR. GARRISON: I appreciate the cooperation of the Board in making this available. What disturbs me is that the very significant words "further reports concerning" --

MR. GRAY: Now you are getting into discussion of a material nature which I don't want to appear in the record at this time. You will not be denied an opportunity to go into that.

MR. GARRISON: May I make one other comment, then, Mr. Chairman. Seven different documents relating to --

MR. GRAY: Is this related to the minutes we have read into the record?

MR. GARRISON: It is related to a request I would like to make to the Board.

MR. GRAY: I would like to say I don't think that type of thing is before the Board at this time. We really are responding to a request that the transcript reflect the minutes of this particular meetings which has been the subject of considerable discussion in these proceedings and about which there possibly will be further discussion. If you have any observations to make for the record or otherwise about other documents, about your relationship with the Commission, or anything that is pertinent to this hearing, you will be given an opportunity to do so, but I don't want to go into it at this time.

MR. GARRISON: When may I go into that, Mr. Chairman?

MR. GRAY: I wouldn't want to establish a precise time. I should think, Mr. Garrison, that it would be satisfactory for the Chairman to assure you that you will have the opportunity. We are in the middle of testimony from witnesses now, and I don't want to get into a long discussion of a matter that is not related to their testimony.

MR. GARRISON: When may I make a request of you for further information relating to this clearance?

MR. GRAY: I don't know that I have ever denied you the opportunity to make a request at any time in these proceedings. I am unable to answer that. I want to give you my assurance that you will be given an opportunity to discuss anything pertinent to this proceeding, and beyond that, I am unable or unwilling to do it at this moment.

MR. GARRISON: I will make this request without argument, Mr. Chairman.

MR. GRAY: Make your request. If you are going to make a request --

MR. GARRISON: For further information.

MR. GRAY: I would say this. I would suggest that any request for materials which are not in the record and which are in the hands of any government agency to which you do not have access should be made to the agency itself, and I should be glad to discuss this with you, Mr. Garrison, but

I do not want to get to an argument at this time in this proceeding about matters which are not pertinent to the testimony that is being given to this Board.

MR. GARRISON: Mr. Chairman, I will follow your instructions. I would like to make the request for the cooperation of this Board and the assistance of this Board in obtaining information. I understand that counsel for this Board did on behalf of the Board ask the Commission for the minutes of the August meeting. I think it appropriate indeed that this Board should make a similar request in connection with the further information which I have in mind. I will state that request at any time you wish.

MR. GRAY: I will now rule that we will not discuss this matter at this time, Mr. Garrison. You will forgive me for becoming impatient. I have made it abundantly clear that we are in the middle of testimony from witnesses, and I am not going to have this reflect at this time discussions about your relationships with government agencies. I repeat my assurance that you will be given an opportunity to say anything that is pertinent to this proceeding, and I think the record will show abundantly that the Board has given every possible cooperation.

I would like now to proceed with the witnesses who will be before us this morning.

MR. ROBB: Mr. Chairman, may I make one brief

comment? We will of course attempt to keep the grist coming to the mill. I am advised, however, of one matter which I think I should tell the Board about.

The Commission has been advised by Mr. Reynolds, who is the business manager for the Radiation Laboratory at the University of California, that because of illness and ill health, Dr. Ernest O. Lawrence, who is the Director of the Radiation Laboratory, and who had been expected to appear here, who I believe has gotten as far as Oak Ridge, we have been advised, will not be able to appear, and he has had to return to the West Coast. I mention that now to explain why we may perhaps have a gap. I hope we won't. I hope we will be able to keep the Board running at full time. I expect we will.

MR. GRAY: Thank you.

General Wilson, do you wish to testify under oath?

You are not required to do so.

GENERAL WILSON: I would prefer to do so.

MR. GRAY: Would you give me your full name?

GENERAL WILSON: Roscoe Charles Wilson, Major General, United States Air Force.

MR. GRAY: Would you raise your right hand? Roscoe Charles Wilson, do you swear that the testimony you are to give the Board shall be the truth, the whole truth, and nothing but the truth, so help you God?

GENERAL WILSON: I do, sir.

Whereupon,

ROSCOE CHARLES WILSON

was called as a witness, and having been first duly sworn, was examined and testified as follows:

MR. GRAY: Would you be seated, General.

Allow me to remind you of the existence of the so-called perjury statutes. May we assume that you are familiar with them?

THE WITNESS: Yes.

MR. GRAY: I should like also to request, General Wilson, that if in the course of your testimony it becomes necessary for you to disclose or refer to restricted data, you notify me in advance so that we may take the necessary and appropriate steps in the interest of security.

THE WITNESS: Yes, sir.

MR. GRAY: Finally, I should say to you that we consider these proceedings a confidential matter between the Atomic Energy Commission and its officials and witnesses on the one hand, and Dr. Oppenheimer and his representatives on the other. The Commission is making no news releases. I express the hope on behalf of the Board that witnesses will take the same view of the situation.

THE WITNESS: May I make a statement, please, sir?

Mr. Chairman, I would like the record to show that

I am appearing here by military orders, and not on my own volition.

DIRECT EXAMINATION

BY MR. ROBB:

Q General, would you tell the Board what your present assignment is, sir?

A I am in the process of change of station. I have just been relieved as Commandant of the Air War College, and am in transit to my new command, which is Commander of the Third Air Force in England.

Q Would you tell us what the Air War College is, sir?

A The Air War College is an adult school to which the military sends selected colonels or Navy captains, members of the State Department and CIA and certain foreign officers who have completed about 15 years of service. These people are schooled in international relations, in military matters, particularly air matters, and in grand strategy. The purpose is to prepare them for positions of high responsibility in the military.

Q How long did you serve as the Commandant or President of that college, sir?

A About two and a half years, sir.

Q Where is that located?

A Montgomery, Alabama.

Q Would you tell the Board, General, something of your

previous military background and history?

A I was appointed to the Military Academy as a result of competitive examination by President Hoover. I graduated in 1928, and from the flying schools in 1929. I was sent to post graduate engineering school from which I graduated -- a one year course, -- in 1933.

Q Where was that, sir?

A That was at Dayton, Ohio. I was an instructor in natural and experimental philosophy at the Military Academy at West Point in 1938 and 1939, and was assistant professor of natural and experimental philosophy there in 1940. I was Chief of Experimental Aircraft Design at Dayton and when the war started, was brought into Washington as Chief, Bombardment Engineering, and later became Chief of Development Engineering for the Staff in Washington, that is the Air Staff.

Q How long have you held your present rank of major general, sir?

A I was made a major general in 1951.

Q General, during the war, what, if any, connection did you have with the atomic bomb program?

A Sir, in 1943, I believe it was, I was directed by General Arnold to make certain that the support of the Army Air Forces was given General Leslie Groves. I served General Groves as a liaison officer while still maintaining my position as Chief of Development Engineering in the Air Force.

My duty was to assist him in procuring materials, scarce items, especially electronic equipment, to make certain that if a bomb were developed that there would be an aircraft to carry it, and later on to make certain that an organization was assembled, trained and equipped to deliver the weapon.

My association with General Groves was not directly under his command, but in his support.

Q What did you do in that connection? Where did you go and what did you do after you got that assignment?

A In Washington I principally with Captain Parsons of the Navy and with Dr. Norman Ramsey and with General Groves, my duty largely was assembling material and getting equipment together, and arranging later on for aircraft to be modified.

In the spring of 1944 I was sent by General Groves to Los Alamos, and there I talked again with Ramsey and Parsons and with Dr. Oppenheimer, and with others who were concerned with the external configuration of the weapons. The idea was to make certain that the aircraft had an equipment in which the bomb would fit, and also to make such minor modifications to the exterior of the weapon as might be necessary to make it fit.

Later on that year, General Groves sent me again to Los Alamos, this time to see if an airdrome could be built on a plateau, and also to recommend to him if I could an area in which some tests might be made. My impression was that he



had several people doing both of these, but I did it also as an independent mission.

Q Did you make such recommendations?

A Yes, sir, I did.

Q What site did you recommend?

A I picked the bombing range at Alamogordo, New Mexico.

Q In that connection did you have occasion to confer with Dr. Oppenheimer?

A I am quite certain I met Dr. Oppenheimer at that time.

Q Following that, what duty did you perform?

A Sir, I monitored the Air Force portion of the program until December. By monitoring I mean I selected the commander of the organization, I made sure that he had personnel, I followed the modification of the aircraft, the supply of the aircraft, and helped where I could to supply the then Manhattan District with the equipments and the military assistance that they desired.

In December, I was relieved and sent to a bombardment wing, and in the summer of 1945 was sent overseas. I remained at Okinawa until both bombs were dropped on Japan, and when I was hurriedly brought home and sent out to Japan again where I joined the party to look at the wreckage.

Q Then there came a time when you returned to the United States?

A Yes, sir. I came back in August or September of 1945, and was assigned as the Deputy to General LeMay, who was then Deputy Chief of Staff for Research and Development.

Q What did you do in that connection?

A He had been brought in to revitalize research and development in the Air Force, and I assisted him in programming where we could.

Q How long did you carry on that work?

A I was there, sir, as I recall until 1947, at which time I was assigned as the Deputy to General Groves, who was then Chief of the Armed Forces Special Weapons Project.

Q What were your duties in that connection?

A They were to reflect in the activities of this joint agency Air Force thinking to the extent it was possible for me to do so. The Armed Forces Special Weapons Project was and is unusual in that it is a service which is common to all of the armed services, and the chief of it is the subordinate of each of the chiefs of service, but not the subordinate of the Joint Chiefs.

Q How long did you stay on that duty, General?

A I stayed there until 1950.

Q Did General Groves stay that long?

A No, sir. He retired. My notes and my mind is a little hazy on this, but he was succeeded by General Nichols in this period, and I served as General Nichols' deputy.

Q Is that General K. D. Nichols who is presently General Manager of the AEC?

A Yes, sir.

Q Did there come a time when you served on the Research and Development Board and the Military Liaison Committee?

A Yes, sir.

Q When was that, General?

A In the latter part of 1948 if my memory is firm. Certainly during 1949 and a part of 1950 I served as a member of the Committee on Atomic Energy of the Research and Development Board. Throughout all this period up until the middle of 1951 I was a member of the Military Liaison Committee.

Q What was your duty in those two connections? What did you do in general? I don't mean a daily diary.

A Yes, I understand. The Military Liaison Committee to the Atomic Energy Commission is an agency which is charged with making certain that the military interests of the nation are properly reflected in the activities of the Commission. It served also as a group -- I am over-simplifying this, sir -- which kept the Defense Department advised of the potentials of the developments of the Atomic Energy Commission.

The Committee on Atomic Energy of the Research and Development Board was a coordinating group designed to

establish programs to prevent overlap and unnecessary duplication in research and development. In the Committee on Atomic Energy, our duties were confined to the field of atomic energy.

Q In connection with your work on those two groups, will you tell us whether or not you came in contact with Dr. Oppenheimer?

A Yes, sir.

Q What were your contacts with him?

A Dr. Oppenheimer was a member of the Committee on Atomic Energy. I think I saw him at almost all of the meetings during 1949. He also served as the Chairman of a long range objective panel on which I had the honor to serve in 1948, and Chairman again of a similar panel or the same panel reconvened in 1950. Of course, he was a member of the General Advisory Committee of the Atomic Energy Commission, and occasionally we saw him in that capacity also.

Q Were your contacts with him rather frequent?

A I would not say frequent, but rather regular. Perhaps I saw Dr. Oppenheimer once every month or so. He was very kind to me and when our panel met out in California he invited me to his home, this sort of an association.

Q General, are you familiar with the history of the position of the military and in particular the Air Force with respect to the thermonuclear weapon?

A Sir, I would like to refer to my notes, if I may.

Q Certainly. Have you recently refreshed your recollection about that matter?

A I did indeed. I struggled with this very problem yesterday.

Q General, I think it would be helpful to the Board if you could give us in your own way something of the history of the position of the military and the Air Force on this matter. You may of course refer to notes to refresh your recollection.

A I find it a little difficult to pinpoint some of these things. For instance, I am aware of a meeting at Los Alamos which had been requested by the scientists to discuss matters of military interest. I remember at that meeting General LeMay was asked what size bomb do you want. There had been a great deal of discussion about smaller bombs. I

remember his saying most vigorously that they couldn't make them too big for him.

I have a lot of this sort of information in my mind, and I am embarrassed that I can't put dates to it. But I do have a few dates.

I have a statement that I found in a document marked top secret, sir, but the statement itself is not top secret. This is a little confusing to me, but it does indicate -- I think it is safe to say it -- that in 1948 both the Research

and Development Board, and the Joint Chiefs of Staff had expressed an interest in continuing research on the thermonuclear weapon. This is the first written statement I can find in my own records -- in 1948.

On September 23, 1949, we had the announcement of the Russian A bomb, and that I really think sparked off the military interest in this larger weapon.

In the early part of October, Drs. Bradbury and Lawrence visited the Armed Forces Special Weapons Project, where they talked to General Nichols and at the same time Dr. Edward Teller visited the Air Force, where they talked to a group at which I was present on the possibilities of a thermonuclear weapon. They urged that the military express its interest in the development of this weapon.

MR. SILVERMAN: Pardon the interruption. Would you mind giving the names of the people who were present again?

THE WITNESS: Drs. Bradbury and Lawrence visited the Armed Forces Special Weapons Project. This was early in October 1949. Perhaps I better clarify something. I am not sure whether Teller's visit to the Air Force was at the same time or shortly thereafter. This is a little hazy in my mind. But in the same general period of October 1949.

On October 13 of 1949 -- and I am sure as a result of the urging of Dr. Bradbury and Dr. Lawrence -- General Nichols, who was of course the subordinate of General Vandenberg,

went to General Vandenberg with General Everest of the Air Force, and urged General Vandenberg as the No. 1 bomber man to express again the military's interest in a large weapon.

General Vandenberg directed Nichols and Everest to express his point of view to the Joint Chiefs of Staff that afternoon, since Vandenberg was not going to be present at that meeting. This they did.

On October 14, 1949, the Joint Chiefs met with the Joint Congressional Committee on Atomic Energy, where General Vandenberg, speaking for the Joint Chiefs, strongly urged the development of this thermonuclear weapon. I have a copy of the excerpts of the notes of the meeting covering General Vandenberg's statement if the committee wishes it to be read.

MR. ROBB: I might say, Mr. Chairman, that has been released by formal action of the Joint Committee, confirmed to General Nichols by letter which we received this morning.

MR. GRAY: You may read it.

THE WITNESS: "Page 1792. One of the things which the military is preeminently concerned with as the result of the early acquisition of the bomb by Russia is its great desire that the Commission reemphasize and even accentuate the development work on the so-called Super bomb. General Vandenberg discussed this subject briefly and stated that it was the military point of view that the Super bomb should be pushed to completion as soon as possible, and that the General

Staff had so recommended. In fact, his words were, 'We have built a fire under the proper parties', which immediately brought forth the comment, who are the right parties.

General Vandenberg replied that it was being handled through the Military Liaison Committee. He further stated that having the Super weapon would place the United States in the superior position that it had enjoyed up to the end of September, 1949, by having exclusive possession of the weapon. There followed a series of questions, somewhat of a technical nature about the Super weapon, which General Nichols answered for the Chiefs of Staff. He stated that it was the opinion of the scientists that the possibility of a successful Super weapon is about the same as was the possibility of developing the first atomic weapon at the 1941-42 stage of development. He stated that the military fears that now the Russians have a regular atomic weapon, they may be pushing for the Super weapon, and conceivably might succeed prior to success in this country of the same project.

When asked to state how super the Super weapon was, he stated that once the principle is proven, there is no limit to its power.

This was on October 14, sir. On October 17, the JCC wrote a letter to the Committee on Atomic Energy and this letter is on file in the Military Liaison Committee, in which they requested further information on the big weapon and expressed some concern that the committee had not asked for



funds to prosecute the project.

MR. GRAY: Which committee?

THE WITNESS: I beg your pardon. The Atomic Energy Commission. This was a letter to the Commission and a copy of this letter came to the Military Liaison Committee.

At that same meeting, the Chairman of the Military Liaison Committee informed that committee of his visit, together with General McCormack and Dr. Manley to Dr. Oppenheimer at Princeton where they had discussed the Super and other problems to be taken up by the General Advisory Committee.

At that same meeting the Military Liaison Committee approved a directive to reconvene the long range objectives panel. This was the second panel on which I had the honor of serving with Dr. Oppenheimer.

On October 27, there was a joint meeting of the Atomic Energy Commission and the Military Liaison Committee, at which the Commission announced that it had asked the General Advisory Committee to consider the Super weapon in the light of recent developments. Then of course on the 28th and 29th of October was the meeting of the GAC.


On November 8, 1949, the MLC at its meeting heard a report from the Secretary that in accordance with the directive to reconvene the long range objectives panel, he had been determining the availability of membership of the panel,

and that he had discussed the panel with Dr. Oppenheimer on the 29th of October, and that Dr. Oppenheimer agreed that the panel should meet but "felt strongly that this should not be done until a great deal more information was available, probably not before February of 1950."

November 9, 1949, is the letter from the AEC to the President.

November 19 was the letter from the President to Admiral Sowers of the National Security Council, and during this period a military committee or subcommittee was set up to advise Admiral Sowers in determining the position on the thermonuclear development. This was a committee composed of General Nichols, Admiral Hill and General Nordstad of the Air Force.

On the 13th of January, 1950, there is a letter to the Secretary of Defense from General Bradley in which the military views are set out. I do not have that document. I have a hazy recollection of what might have been in it, sir. I do know that it expressed concern lest the Russians come up with this bomb before the United States did, and the feeling that this situation would be intolerable, since it would reverse the advantage we had had in this country prior to the Russian A bomb explosion.

 The rest of my notes are to the effect that in February the Air Force announced that it had undertaken the

development of an aircraft to carry a weapon of this sort, and a program which it was coordinating with the AEC.

On February 18 -- and I would like to say that my memory of this date is not certain -- I have noted February 18, 1950, to the best of my knowledge, the long range objectives panel was completed and submitted to the Committee on Atomic Energy.

BY MR. ROBB:

Q Can you tell us about that report, General?

A This panel was composed of a group of military people, of which I was one, and the Chairman was Dr. Oppenheimer. Another member was Dr. Bacher, and another Dr. Luis Alvarez. The panel contained some conservative statements on the possibility or the feasibility of an early production of a thermonuclear weapon. These reservations were made on technical grounds. They were simply not challengeable by the military. They did, however, cause some concern in the military.

It is hard for me to explain this, except to say that most of us have an almost extravagant admiration for Dr. Oppenheimer and Dr. Bacher as physicists, and we simply would not challenge any technical judgment that they might make. But I must confess, and I find this exceedingly embarrassing, sir, that as a result of this panel and other actions that had taken place in the Committee on Atomic Energy, that I felt

compelled to go to the Director of Intelligence to express my concern over what I felt was a pattern of action that was simply not helpful to national defense.

Q Action by whom?

A By Dr. Oppenheimer.

Q Would you explain what that pattern was?

A I would like first to say that I am not talking about loyalty. I want this clearly understood. If I may, I would like to say that this is a matter of my judgment versus Dr. Oppenheimer's judgment. This is a little embarrassing to me, too. But Dr. Oppenheimer was dealing in technical fields and I was dealing in other fields, and I am talking about an overall result of these actions.

First, I would like to say, sir, that I am a dedicated airman. I believe in a concept which I am going to have to tell you or my testimony doesn't make sense.

The USSR in the airman's view is a land power. It is practically independent of the rest of the world. I feel that it could exist for a long time without sea communications. Therefore, it is really not vulnerable to attack by sea. Furthermore, it has a tremendous store of manpower. If you can imagine such a force, it could probably put 300 to 500 divisions in the field, certainly far more than this country could put into the field. It is bordered by satellite countries upon whom would be expended the first fury of any land assault that would be launched against Russia, and it

has its historical distance and climate. So my feeling is that it is relatively invulnerable to land attack.

Russia is the base of international Communism. My feeling is that the masters in the Kremlin cannot risk the loss of their base. This base is vulnerable only to attack by air power. I don't propose for a moment to say that only air power should be employed in case of a war with Russia, but I say what strategy is established should be centered around air power.

I further believe that whereas air power might be effective with ordinary weapons, that the chances of success against Russia with atomic weapons or nuclear weapons are far, far greater.

It is against this thinking that I have to judge Dr. Oppenheimer's judgments. Once again, his judgments were based upon technical matters. It is the pattern I am talking about.

I have jotted down from my own memory some of these things that worried me.

First was my awareness of the fact that Dr. Oppenheimer was interested in what I call the internationalizing of atomic energy, this at a time when the United States had a monopoly, and in which many people, including myself, believed that the A bomb in the hands of the United States with an air force capable of using it was probably the greatest deterrent

to further Russian aggression. This was a concern.

On technical grounds, Dr. Oppenheimer did not support the full long range detection program of the Air Force. The Air Force had been charged by the Joint Chiefs of Staff with determining the first atomic bomb which might be exploded in Russia. To do this, the Air Force felt that it required quite an elaborate system of devices. Some were relatively simple to produce, some of them were exceedingly difficult to produce, and some of them were very costly. Dr. Oppenheimer was not enthusiastic about two out of three of these devices or systems. I do not challenge his technical judgment in these matters, but the overall effect was to deny to the Air Force the mechanism which we felt was essential to determine when this bomb went off. In our judgment this was one of the critical dates, or would be at that time, for developing our national defense policy.

Dr. Oppenheimer also opposed the nuclear powered aircraft. His opposition was based on technical judgment. I don't challenge his technical judgment but at the same time he felt less strongly opposed to the nuclear powered ships. The Air Force feeling was that at least the same energy should be devoted to both projects.

You will note that a ship, even though it is tactically offensive, is strategically defensive, whereas the nuclear powered aircraft is a strategic offensive weapon, and it was one in which the

Air Force still places great hopes.

The approach to the thermonuclear weapons also caused some concern. Dr. Oppenheimer, as far as I know, had technical objections, or let me say approached this conservatism for technical reasons, more conservatism than the Air Force would have liked.

The sum total of this to my mind was adding up that we were not exploiting the full military potential in this field. Once again it was a matter of judgment. I would like to say that the fact that I admire Dr. Oppenheimer so much, the fact that he is such a brilliant man, the fact that he has such a command of the English language, has such national prestige and such power of persuasion only made me nervous because I felt if this was so, it would not be to the interest of the United States, in my judgment. It was for that reason that I went to the Director of Intelligence to say that I felt unhappy.

MR. ROBB: That is all I care to ask, Thank you, General.

#### CROSS EXAMINATION

BY MR. SILVERMAN:

Q General, you said you are not raising a question of loyalty?

A No, sir.

Q You do not question Dr. Oppenheimer's loyalty?

A I have no knowledge in this area at all, sir.

Q Do you --

MR. ROBB: Wait a minute. Let him finish his answer.

THE WITNESS: I have no knowledge one way or another.

BY MR. SILVERMAN:

Q Have you any information to indicate that Dr. Oppenheimer has been less than discreet in the handling of classified information?

A No, sir, I haven't. Maybe I talk probably too much. Please.

A I read an article on the way up to Washington in the U. S. News and World Report, and this was a considerable surprise to me --

Q Excuse me. If you are going to tell us something that you know about, we are all interested to hear it.

A I beg your pardon?

MR. ROBB: Wait a minute.

MR. SILVERMAN: Let me finish, Mr. Chairman.

If Mr. Robb or the Chairman thinks what I am saying is wrong --

BY MR. SILVERMAN:

Q I would think if all you would do is tell us about an article in U. S. News and World Report, we would do better reading the article.

MR. ROBB: I think what the General refers to is the letter of General Nichols and Dr. Oppenheimer's letter, which



has been frequently referred to.

THE WITNESS: Yes, this is what I am speaking of. This was news to me. I assume you are speaking of the period in which I served with Dr. Oppenheimer, and my answer to your question is no, I do not.

MR. GRAY: I did not understand that.

THE WITNESS: I was not aware of any indiscretion on the part of Dr. Oppenheimer in the handling of classified material in the period in which I served with him.

BY MR. SILVERMAN:

Q I have some notes on some of the things you said, and I think I would like to run through them and ask for elaboration where questions arose in my mind, sir.

A Yes, sir.

Q I think you said you are appearing on military orders and not on your own volition?

A Yes, sir.

Q I take it you didn't ask for these orders?

A I certainly did not.

Q What was the first intimation that you had, sir?

A I was telephoned about three or four days ago by General McCormack of Personnel of the Air Force saying that by verbal orders of the Chief of Staff of the Air Force I was to report to this committee.

Q And you then reported to --

A I then reported to Mr. Robb.

MR. ROBB: That is the first time any major general ever reported to me.

BY MR. SILVERMAN:

Q You stated, I believe, you went through your notes and gave various dates of expressions of military interest in the hydrogen bomb.

A Yes.

Q I think you said that the Russian explosion of September 23, 1949, really sparked off the military interest in the hydrogen bomb or some such phrase?

A Some such phrase. The interest was there, but this certainly in my opinion, at least from where I saw it, the little piece in the Air Force, this certainly at least gave impetus to the interest.

Q By that I take it you mean that the Air Force was much more actively and intensely interested after September 23, 1949, than before?

A Yes, that is a fair statement.

Q I think you said that the long range objectives panel was completed. I take it unless my notes are wrong the report of the panel was completed and submitted to the Committee on Atomic Energy on February 18, 1950, I thought you said.

A That is the best of my recollection, February 18, 1950.

Q Could it be 1951?

A I am very sorry. This is the one date on which I am really worried. I regret that I had to do some rather hard research and I must say it could have been 1951. Wait. February 1951?

Q Is there some way you could find out rather readily? There is no desire here by anybody to trap you on anything. I just want to get the facts.

A I apologize, sir, this was a bad date. I could find out if I could make a phone call, sir.

MR. ROBB: I may be able to help you on that. Is that the one Dr. Kelly was on?

THE WITNESS: Yes, he was on that panel. This was a panel of the Committee on Atomic Energy.

BY MR. SILVERMAN:

Q I have here some references to a report of the panel in the testimony, part of which was classified, and therefore I don't have it, but I think in the unclassified portion a date was given of December 29, 1950. I think that is the date you gave, Mr. Robb. Let me see if I can find the place? On page 196 of the record, Mr. Robb, you referred to a report which of course I have not seen, dated December 29, 1950, and I do not know whether that is the report the General is talking about. I just don't know.

MR. ROBB: The report entitled, "Military Objectives

on the Use of Atomic Energy, to the Atomic Energy Committee of the Research and Development Board of the Department of Defense."

THE WITNESS: This sounds right. Is there a cover sheet with the list of members?

MR. ROBB: I don't have that here. That was December 29, 1950. Then January 6, 1951, if I might give this, Mr. Silverman, to assist you, the General Advisory Committee considered that report and commented that it stated the military objectives with clarity and keen insight into the reality of the present situation. Mr. Whitman and Dr. Oppenheimer participated in the report, abstaining from taking action on the matter.

MR. GRAY: I should like to ask counsel if he wants to establish this date, perhaps we could recess and let General Wilson make his telephone call.

MR. SILVERMAN: I think that would be the sensible thing to do. I think that is the easiest way to do it.

MR. GRAY: We will recess for a few moments.

(Brief recess.)

MR. GRAY: Would you proceed.

BY MR. SILVERMAN:

Q Have you now ascertained that date, General?

A I have. The correct date is 18 January of 1951, which is the date of the approval by the Committee on Atomic

Energy.

Q General, I would like you to cast your mind back now to that period as well as you can. Do you know whether that was the time at which the feasibility of the thermonuclear weapon technically appeared to be at almost its low period?

MR. ROBB: What period are we talking about now?

MR. SILVERMAN: January 1951.

THE WITNESS: Of course, you realize I am guessing it was pretty low in my opinion. It was similar to most projects of this sort. There is a certain optimism, then there is a period of pessimism, and then the optimism grows again. My feeling is that it became lower a little later, and it became lower because of some doubt as to the amount of a very scarce and costly material.

BY MR. SILVERMAN:

Q Was it lower then, do you recall, as to the prospects of feasibility than it had appeared, say, a year earlier which was the time of the President's directive?

A Sir, you are asking me to pass judgment on a technical matter.

Q If you don't know, say so.

A I don't know.

Q And you don't recall discussions at that time?

A Yes, sir, I can remember discussions among the scientists.

Q What did the discussions among the scientists indicate to you?

A You see, my oracle in this matter was Dr. Oppenheimer and they indicated that this was a difficult job. I speak of oracle as Chairman of this board. He was the expert.

Q Do you recall who the other members of that panel were?

A I recall some of them. I didn't write down their names. Dr. Oppenheimer, Dr. Bacher, Dr. Alvarez, Dr. Kelly, I was a member, General James McCormack was a member, General Nichols was a member, but I don't believe he attended the meetings as a member. He was in the process of transfer about this time.

Q I have here a list which might be helpful to you, sir. Dr. Lauritsen was a member of the committee?

A Yes, sir.

Q I think you mentioned Dr. Whitman, did you not?

A Dr. Whitman was, yes.

MR. SILVERMAN: That is the list, Mr. Chairman. It is Item 5 on Dr. Oppenheimer's biography in section 2, "Membership on Government Committees." It is item 5(b).

BY MR. SILVERMAN:

Q Did you mention Admiral Parsons?

A And Admiral Parsons. I beg your pardon.

Q Instead of our doing this the hard way depending on my recollection of what you said, let me read the list as I

have it, and see if that accords with your recollection.

A All right.

Q Dr. Oppenheimer was Chairman; Dr. Bacher, Dr. Alvarez, Dr. Lauritsen, Dr. Kelly, Dr. Whitman, General Nichols, Admiral Parsons, yourself, General McCormack, with David Beckler as secretary.

A That is correct. I also recollect that Nichols did not act as a committee member. I do think he appeared on that, but he was not a member.

Q Those people in addition to Dr. Oppenheimer's scientific knowledge, Dr. Bacher is an eminent physicist, is he not, and a great man who had great knowledge in this field?

A That is correct.

Q And he joined in the report, did he not?

A That is correct.

Q Did he question the statement about the feasibility of the hydrogen bomb as it then appeared?

A I am searching my memory pretty hard, but my recollection is that Dr. Bacher supported Dr. Oppenheimer in this view.

Q They all signed the report?

A This is something else I don't recall. I don't recall signing a report. I recall that the report was prepared and it contained a statement that there was no substantial difference in opinion or no important disagreement

or something of that sort. It was then submitted to the Committee on Atomic Energy which voted to accept it or otherwise. I don't recall signing it.

MR. SILVERMAN: Perhaps Mr. Robb, could you clarify that point, because I take it you have the report?

MR. ROBB: I don't have it.

MR. SILVERMAN: I am sorry. I thought when you questioned Dr. Killy on the basis of having signed the report --

MR. ROBB: No.

THE WITNESS: It would be normal to sign the report, but I don't recall that this is an important point.

BY MR. SILVERMAN:

Q Dr. Lauritsen was an eminent physicist, was he not?

A Yes, sir.

Q And a man very well informed on matters of nuclear weapons?

A Each of these civilians really was in a similar class.

Q Did he join in the technical judgment as to the feasibility of the hydrogen bomb?

A I don't recall the discussion.

Q Did he disagree?

A The statement in the report was to the effect that there was no substantial disagreement in the report as finally drafted.

Q Dr. Alvarez was an eminent physicist, was he not?



A Yes.

Q And a man who is very familiar with matters of nuclear weapons?

A Yes.

Q He was a man who rather favored the development of the hydrogen bomb. He took a different view from the members of the General Advisory Committee, did he not?

A I am sorry, sir, I don't recall.

Q In any event, he was very familiar with matters of nuclear weapons.

A As far as I know, yes, sir.

Q And you do not recall that he expressed a dissent on this point?

A No one dissented. As I recall there was discussion in the meeting but when the report finally was drafted, it was submitted with the statement that there was no important difference of opinion in the report as submitted.

Q You have no doubt that was a correct statement?

A I think that was a correct statement. But I would like to make this reservation, sir.

Q Yes.

A Certainly I as a military man did not engage in the technical part of this discussion. I don't think the military people were in a position to debate the technical judgment.

Q We of course all realize that while your knowledge

of these matters is doubtless greater than you perhaps like to admit for reasons of modesty, your knowledge is certainly not that of these scientists by a long shot.

A That is correct.

Q We don't for a moment question that fact. What about Admiral Parsons, was he quite familiar with these matters?

A I would say Admiral Parsons was probably as close to a scientist as we had in our group.

Q And he had been at Los Alamos, too, had he not?

A Yes, sir.

Q Short of being one of these four nuclear physicists that I have mentioned, he really was very familiar with the problems of nuclear weapons and the scientific aspects of them?

A I think among military men he was certainly as well informed as anyone.

Q He, too, of course, joined in the report. They all joined?

A There was no important disagreement.

Q General Nichols -- you said that he did not really actively participate.

A That is my recollection, sir.

Q Yes. It occurs to me that this matter of the date of that panel has perhaps another important bearing which I would like to suggest to you, and see whether I am right. January 1951 -- indeed I think December was the date of the

report itself, December 29, or something like that.

A Yes, sir.

Q We were already in the Korean war, is that not correct, General?

A Yes.

Q And that started, I think, in June of 1950?

A In June.

Q When did the Chinese intervention come?

A Oh, my goodness, sir, I regret I just don't remember.

Q Wasn't it just about that time, or just a little before that?

A I don't recall.

Q Wasn't it in December, I think, of 1950?

A I am sorry, I don't remember. I would have to refresh my memory.

Q Let me suggest this to you. If this doesn't refresh your recollection, it doesn't. Had there not been alerts of possibility of enemy aircraft at about that time, shortly after the Chinese intervention? Do you recall that?

MR. ROBB: Mr. Silverman, I am not quite clear what the question means. Maybe the General is. You mean alerts of enemy aircraft here or in Korea?

MR. SILVERMAN: I think perhaps in the North American continent.

THE WITNESS: I was not aware of any such thing.

BY MR. SILVERMAN:

Q Was not the panel concerned, the Chinese intervention -- I am merely suggesting this to you.

A I will accept this for lack of notes of my own.

Q I regret to say I have not myself looked it up. That is my information.

Was not the panel concerned at that point about the possibility of an eruption of a general war in the near future?

A Yes, that is fair. This is almost a constant state of mind, sir.

Q Well --

MR. ROBB: Let him finish.

THE WITNESS: We are always worried in the Pentagon about an accident which might start trouble. Surely this was a tense period.

BY MR. SILVERMAN:

Q More so than an earlier year?

A Yes.

Q Was not the problem of the panel one of trying to make suggestions as to the use of atomic weapons in the event of an emergency which might arise in the very near future?

A No, sir, that would be a military judgment, and this panel was a technical panel which was attempted to develop guidance for research and development projects.

Q Were suggestions made at that panel as to the

possible use of atomic weapons that might be feasible and useable in the quite near future, much nearer than it looked as if a hydrogen bomb could be developed?

A I have no recollection, frankly, sir, but I would very much be surprised if this group of people at that time didn't discuss those things.

Q Do you recall discussions of the use of the atom in some versatile way in an emergency which might occur very soon, at that panel discussion?

A You mean as a radiological warfare type of operation? I am afraid I don't understand.

Q I am afraid I don't know myself. I am thinking of recommendation for the use of smaller atomic weapons to be carried on a small airplane.

A Yes.

Q Was that discussed at that time?

A Yes.

Q Was that recommended?

A Yes, this program was recommended. There has always been an interest in this field.

Q And that was a matter which looked a good deal more feasible in the quite near future than the hydrogen bomb, did it not?

A Yes, I think that is a fair statement.

Q Do you recall you were rather enthusiastic about the

prospect of that?

A I am first of all a big bomb man, but I do recognize the potential value of the so-called tactical weapons. Here was an opportunity to increase the stockpile of weapons. This, of course, was something of importance to all of us. This had more to do than simply developing weapons of smaller size. These were still very potent weapons.

Q I gather that even the smaller atomic weapons are very potent weapons.

A I am not expressing myself well. These are still large weapons to be carried by large aircraft. There was a technical development which promises to still increase the number of bombs. This was of great importance to us at that time.

Q And that was discussed at that time?

A Yes.

Q Was that a development that looked as if it would be useable in the event of an emergency in the near future but more likely to be useable than, say, a hydrogen bomb?

A Yes.

Q I think you said that you are a big bomb man, and at an earlier stage you referred to yourself as a dedicated airman. I assume that the two are not quite the same, but those are both parts of your views.

A I mean that I believe in the theories of Douhet and

Mitchell and Admiral Mahan as modified to fit the present war. This is a belief that the objective of war is not the defeat of the enemy's army, but the defeat of the enemy's will to wage war. That this comes about only after failure to win the real victory, which is the prevention of war.

Q The views you have expressed I take it are your views as a dedicated airman and a believer in big bombs.

A That is correct.

Q I don't mean for a moment that you get any pleasure out of the dropping of big bombs. You understand that, of course.

A That is correct.

Q Are the views you expressed pretty much unanimous views among the informed people of the Air Force?

A There are a great number of people who belong to this school of thought. They might not subscribe to my views precisely as I have expressed them to you. I don't want to be coy or over-cautious here, but I would not speak for the whole Air Force. But there are members of this group.

Q Are there people in the Air Force who don't agree with you?

A Yes, there are.

Q People of good faith?

A That is correct.

Q You refer to yourself as a dedicated airman. I

take it that a dedicated naval officer might have somewhat different views?

A I hope that we are all dedicated Americans. When I say this, I mean our dedication is to the preservation of the United States. I don't want to sound sentimental to you, but this is the idea. I have over-simplified my statement by saying I am a dedicated airman. I believe that proper defense lies along the line that the Air Force proposes, or that I suggest. I know that the other services have other views.

Q And you are not surprised that the civilians have perhaps still other views.

A No, sir.

Q Do you recall that just about the time of the GAC meeting, just a couple of weeks before it, I think, there was some testimony before the Committee on Armed Services of the House of Representatives. I think the newspapers may have called it the Battle of the Admirals, or something. It was the discussion of the B-37. Do you remember testimony of Admiral Ofstie?

A Yes. Let me say I recall that he did testify. I don't recall just what it was. I know I didn't like it at the time.

Q Is this part of what you didn't like? I am reading from page 183 of the hearings before the Committee on Armed Services, House of Representatives, 81st Congress. The dates



of the hearings run October 6 to 21, 1949. I don't have here unfortunately the number of the document as such. It is page 183 -- it is somewhere in October. I can't tell without running through it which precise day it was. Page 183, Admiral Ofstie was testifying:

"There is a widely held belief that the Navy is attempting to encroach on strategic air warfare, and that this was the principal consideration in planning the so-called super carrier. This is a misconception which is quite at variance with the facts. We consider the strategic air warfare as practiced in the past and as proposed in the future is militarily unsound and of limited effect, morally wrong and decidedly harmful to the stability of a possible world war."

I take it that is part of the statement with which you disagree?

A I don't agree with any part of it from start to finish.

Q You don't question Admiral Ofstie's good faith in making the statement?

A I most seriously question his good judgment in making such a statement.

MR. GRAY: I would like to ask if your purpose is getting somebody else's views in this record, or whether you are questioning the General about something that he can testify about.

MR. SILVERMAN: The General did not testify about this, sir. At least not that I know of. What I am attempting to do, sir, is to see if the General will agree with me that it is possible in good faith for people whose patriotism is unquestioned to hold these views.

MR. GRAY: He has stated unequivocally for the record that he does agree with you. I want to make myself clear in my question to you. We have allowed, so far as I know, almost unlimited latitude in what has been brought before the Board, hearsay, documents which at times seemed to the Chairman to be really unrelated to the inquiry, but if you feel this is important to further establish the fact that the General agrees with you, I would let you argue for your point, but I believe he has stated clearly that it is possible for people of good faith to be in disagreement on these matters. There is no question in your mind about it?

THE WITNESS: There is no question in my mind, no, sir.

MR. GRAY: If that is your point, I think it has been well made.

BY MR. SILVERMAN:

Q I think you questioned Dr. Oppenheimer's judgment on a number of matters. You said that Dr. Oppenheimer was interested in the internationalizing of atomic energy at a time the United States had a monopoly of it, and that was the greatest deterrent to Russian aggression. I take it you

concede -- excuse me, I am not meaning to be sarcastic at all -- I am sure you do concede that Dr. Oppenheimer did play a great role in the development of the atomic bomb which did become this great deterrent to Russian aggression?

A Yes, sir.

Q Did you hear at the time of this discussion of internationalizing of atomic energy that it was the view of many scientists that Russia would have the atomic bomb in time anyhow?

A Yes, I think I understood this to be the case.

Q And therefore perhaps it might be better to internationalize it while there was a chance to do so?

A I had never heard that argument.

Q You did not?

A No.

Q You did know that many people of good faith did urge that point?

A I am not aware. I don't believe I have ever heard that argument.

Q I did not make myself clear. You stated you had not heard that argument, and I did not therefore make my next question clear. You did know that many people of good faith, many informed people, were in favor of what came to be known as the Acheson-Lilliental and later the Baruch Plan?

A I don't think you are speaking of quite the same

thing. The Baruch Plan had certain safeguards in it which change it from what I believed to be Dr. Oppenheimer's earlier program. It was less general, let us say.

Q Would it surprise you to learn that there are those who think that it was more general?

A That is possible.

Q Do you know that Dr. Oppenheimer supported the Baruch Plan?

A Yes.

Q And of course the Russians opposed it?

A Yes.

Q Had you heard that it was Dr. Oppenheimer's view that inspection is not enough, that you could not be sure that the Russians would not evade inspection, and therefore it was necessary to have an international agency that would itself be the only one that could?

A I didn't know this as a fact, I am sorry.

Q I think you said on technical grounds Dr. Oppenheimer did not support the full long range detection program of the Air Force?

A That is my recollection, yes, sir.

Q That he was not enthusiastic about two out of three of these devices.

A Yes.

Q I think you also said you do not challenge Dr.

Oppenheimer's judgment?

A That is correct.

Q As to the two out of three devices that Dr. Oppenheimer did not support, do you recall that he was always in favor of continued research on them?

A Oh, definitely. My recollection is that in most of these matters Dr. Oppenheimer always favored research. I have never heard him at any time say that the field was closed and we needed no more study or research.

Q Did you understand Dr. Oppenheimer's lack of enthusiasm for these two devices was based on the then state of technical development of those devices?

A Yes, I believe that I understood that this was why he was not enthusiastic.

Q Are these two devices that Dr. Oppenheimer was not enthusiastic about now in effect?

A Yes, sir.

Q Were they bettered by research?

A Of course.

Q You said two of three devices. I would like to turn to the third device, the one that he was enthusiastic for.

A Well, yes, all right.

Q I don't want to put words in your mouth.

A It is hard for me to talk about these things. We are not naming names. They were three. They were of

relative degrees of development or lack of development. The one that appeared to be most immediately promising, the one that perhaps we had the most information on was the one that Dr. Oppenheimer supported to the greater degree.

Q Do you recall the circumstances of the development of that method?

A Only vaguely. That it was during the war. I was conscious that it was being done, because I had been asked for aircraft to assist in some of the experiments. This is the limit of my knowledge.

Q Do you know that it was under Dr. Oppenheimer's direction at Los Alamos that that first system for long range detection of atomic explosions was initiated?

A I don't know that as a fact, but I am not surprised, sir.

Q And that it was done substantially at the same time as we were developing the atomic bomb?

A I knew the activities were about the same time. Of this I was aware.

Q Was it done at Los Alamos?

A This I don't know, sir, because of the compartmentalization of that project. I don't know who was doing it.

Q Do you know whether Dr. Oppenheimer directed the first trial of that method?

A No, sir, I don't.

Q I think you said Dr. Oppenheimer opposed nuclear powered aircraft and was less strongly opposed to nuclear powered ships.

A On technical grounds. My statement was that he was opposed to these in this order. He had a time scale. As I recall it was the orderly development of these in series appealed to him. I am trying to say why one was ahead of the other. So far as I know it was only on technical grounds that he objected or opposed these.

Q And you do not question his technical judgment?

A No, sir.

Q Was he alone in this technical judgment?

A No, sir.

Q Were there other well informed scientists who joined with him?

A Yes, I am sure there must have been, because there was a great deal of controversy in this area.

Q Was his opposition in committees or did he make public statements?

A These were in committees. I don't recall any public statements on the matter.

Q And these committees did have other scientists on them?

A Yes.

Q With respect to Dr. Oppenheimer's opposition to nuclear powered flight and the apparent support of nuclear

powered ships --

A Perhaps opposition is not the word. I wish we could find a better word.

Q Lack of enthusiasm?

A Lack of confidence in the timely success, or something of that sort. I don't think I have ever heard Dr. Oppenheimer doubt that this would be accomplished, but it was always 15 to 20 years, so far away that there were many other things that we could do more profitably now.

Q Was there not a statement made, perhaps by the Chief of the Air Force, in any event by a very important official of the Air Force -- I don't happen to know the name -- within the last year or so in which he said that nuclear powered flight looked like something we might have in about 20 years?

A I don't know what, sir, I am sorry.

Q Do you recall the Lexington Study on nuclear powered flight?

A Yes, I do.

Q What was their conclusion?

A This was a study to make a statement, if possible, on the feasibility of achieving nuclear powered flight. The report was rendered by Dr. Whitman, I believe, who was the Chairman, and immediately there was a controversy as to what the report meant. The Air Force maintained that the Whitman



Report stated that nuclear powered flight was feasible provided certain things were done. The opponents to the project said that these things that had to be done were of such a nature as to rendere the program infeasible. This is my recollection of it.

I personally think that the Whitman report or Lexington report stated that the project was feasible.

Q Did the report say anything about the time scale in which one could hope to have nuclear powered flight?

A I am sure it did, but I don't recall what it was. It was not tomorrow. I don't want to give the impression that I feel that ifwe had poured all the money we had available into this project we could have had a nuclear airplane in a matter of months. We knew it was going to take time. But our argument was that the sooner we got to it, the better off we would be.

Q Do you remember what Dr. Oppenheimer's participation was in the Lexington study?

A I am sorry, I do not.

Q Do you remember whether he did more than give a few briefings to the committee?

A I really do not know.

Q It has been the consistent position of the Air Force that nuclear powered flight should be pushed?

A Yes.

Q In fact, however, have the Air Force come up with different programs for nuclear powered flight from time to time?

A We have to my knowledge come up with two. The first one failed to gain the scientific support essential. It was then reorganized on a different basis which promised greater support, especially from the Atomic Energy Commission. These are the two that I know of.

Q What are the dates of those?

A I am very sorry.

Q Did the second program substantially revise the first one?

A Yes, I think that it changed the time scale. I had left this business before really I could see it get under way so I am not too competent to discuss it, but it did revise the time scale, setting up a program somewhat longer than the Air Force would have liked.

Q Do you know what the time scale was, that is, the revised time scale?

A No, sir, I do not.

Q Would it be fair to say that the revision of the program was to bring it more into accord with what appeared to be the technical realities of the situation?

A I can only make an assumption here. I assume that it did.

Q As to the difference between nuclear powered aircraft

and nuclear powered ships, do you doubt that the possibility and the time scale of nuclear powered ships is very different indeed from that of nuclear powered flight?

A This is an area of debate. You can find a lot of answers to this. As far as I am concerned, I recognize that the problem is more difficult in the airplane. There were at that time and still are a large number of aeronautical engineers who could have been put to work on this project. My own feeling is that it probably would have lagged behind the submarines but that if we had given it a real push, it might not have lagged too far behind.

At any rate, such an airplane would be of such importance to this nation that my own feeling is that we should have prosecuted it vigorously from the start.

Q Would you concede that it was possible for men of good faith, technically informed on the subject, to feel that it made sense to proceed with the nuclear powered ships at a somewhat faster pace than nuclear powered flight?

A I have heard that discussion, yes, sir, and I will concede that.

Q The fact is, is it not, that at least the scientists seem to feel that there are fewer technical difficulties with respect to nuclear powered ships than with nuclear powered flight?

A Yes, sir.

Q I don't suggest either of them is easy. I think the newspapers indicate that the submarine has been produced.

In any event, certainly Dr. Oppenheimer did press for continued research in both areas and particularly in the area of nuclear powered flight.

A I can't answer that in the affirmative. I think that Dr. Oppenheimer pressed for continued research and experiment in reactors which in time might have contributed to nuclear powered flight. I won't say that Dr. Oppenheimer pressed for nuclear powered flight.

Q I didn't mean that. I mean pressed for research.

A Yes, that is correct.

Q He did keep saying let us find out about as much of this as we can.

A Yes.

MR. ROBB: Wait a minute.

THE WITNESS: In reactors.

BY MR. SILVERMAN:

Q Didn't he say let us find out what we can about nuclear powered flight, too?

A My recollection is that he didn't. I am not even sure that he showed an interest in flight. This is my recollection.

Q These reactors of course were essential for nuclear powered flight?

A Yes.

MR. SILVERMAN: I have no further questions. Thank you, General.

MR. GRAY: General, I would like you not in any way to take offense at my first question of you.

You stated for the record that you were here under orders.

THE WITNESS: Yes, sir.

MR. GRAY: I think all of us understand what that means. But by that, do you mean that your presence here is a result of military orders, and am I correct in assuming that your testimony is your own, and not in any way involved with military instructions?

THE WITNESS: My testimony is my own, sir. By this I meant, and I expressed myself very awkwardly, that I find this a very painful experience because of my admiration for Dr. Oppenheimer. I am exceedingly sorry that this is taking place, and I don't think I would have volunteered to come up here to make statements of this sort.

MR. GRAY: I think that the Board is aware of the painful nature of the matter.

General Wilson, approximately when did you feel impelled to go to the Chief of Air Force Intelligence?

THE WITNESS: This was after this long range objectives panel, the date of which I had confused. It was

in January of 1951. I went to Intelligence and I remember going actually from one of these panel meetings, rather than to the Provost, because my feeling was not one of making charges, but I was uncomfortable. I was worried about something I could not put my hands on. I saw somebody to consult with.

MR. GRAY: I am a little confused by that last answer and your reference to some officer other than the Chief of Air Force Intelligence.

THE WITNESS: If I had thought that there had been an overt act or a deliberate move to obstruct the proper defense of the country, something of that sort, I would probably have appealed to the Provost Marshal. This would have been my duty to do so and make charges. But this is not a matter of charges. This was a matter of really worry that a general pattern of activity coming from a man of such stature seemed to me to be jeopardizing the national defense. Once again this is bluntly understated, but it was a worry, a concern. I wanted to discuss it with someone I thought was knowledgeable in this sort of an area.

MR. GRAY: You felt that the security of the country might be somehow involved?

THE WITNESS: Yes, sir.

MR. GRAY: You stated, General Wilson, on the basis of your association -- I believe you stated -- with Dr.

Oppenheimer, you did not doubt his loyalty to the United States?

THE WITNESS: I have no knowledge of this at all, sir. I certainly have observed nothing nor have I heard him say anything that I personally would say was disloyal. In fact, sir, it seems to me that he has demonstrated his loyalty, once again in a private opinion, in the tremendous job he has done for this country. I have just no knowledge of this.

MR. GRAY: I should like to ask you another question on this point. It may be a difficult one to answer. Is it possible, do you think, for an individual to be completely loyal to the United States, and yet engage in a course of conduct which would be detrimental to the security interests of the United States?

THE WITNESS: Yes, I do.

MR. GRAY: I would like to refer now to what you described as a pattern of conduct. You mentioned several things. The internationalization of atomic energy has not been accomplished. With respect now to the long range detection system, have these other two that have been under discussion here been developed, and are they now in use?

THE WITNESS: Yes, sir, they have been developed and are in use. It was a bitter wrangle to get them developed, but they are in use.

MR. GRAY: With respect to nuclear powered aircraft,--

I don't know what the security problem is in this next question -- may I ask you whether this is a promising field at the present time?

THE WITNESS: Technically, sir, I don't feel qualified to answer. But strategically it is a field of tremendous promise, because here is an airplane that can do such things as overfly Russia at local midnight at every point of surface in the land. It can fly at high altitude or low altitude at the same speeds. Things of this sort which are not possible of accomplishment with the present day airplane. These are areas of promise that make it of such importance to the Air Force.

MR. GRAY: I suppose I should state frankly the purpose of this series of questions. You have stated that you do not question Dr. Oppenheimer's technical judgment and competence.

THE WITNESS: Yes.

MR. GRAY: You made that very clear. I am trying to find out really whether in these several things that you referred to as constituting what might be a pattern of conduct, whether events have shown technical judgment in this case to have been faulty. Let me say for the record this Board is not asked to pass upon the technical judgment of anybody, and is not competent to pass upon it. But it seems to me an answer to my question is pertinent to the part of the inquiry that



we are engaged in. So I ask whether in these areas subsequent events have proved the validity or otherwise of these technical judgments which you accepted more or less without question, I believe you said, from Dr. Oppenheimer. We know that internationalization of atomic energy has not been accomplished.

With respect to the others --

THE WITNESS: Of course, the long range detection program has been accomplished. I don't recall that Dr. Oppenheimer ever said that this couldn't be done. It was just perhaps that we ought to concentrate on the portions that could be done readily and quickly. I don't remember exactly the argument. It was essentially that, -- do what we can and perhaps that is the best we can do, this sort of thing, and for the rest let us experiment. The Air Force was frantic because it was charged with the job of detecting this first explosion and it felt all three methods had to be developed and put in place or it would fall down on its job.

MR. GRAY: I think I won't press you on the answer to the question as I asked it, because it is not a good question.

THE WITNESS: Yes, sir, I am sorry.

MR. GRAY: General Wilson, with respect to what might be called the philosophy of strategy in a conflict with the Soviet Union, is it your view as a dedicated airman today, knowing what you know about our capabilities in the field of nuclear weapons, that these weapons are important?

THE WITNESS: Vastly, yes, sir.

MR. GRAY: And as an airman, would you feel that even with improvements in the atomic weapons, which may have taken place in these years we have been discussing, these are still important weapons, that is, the thermonuclear?

THE WITNESS: Yes, sir.

MR. GRAY: You feel as an airman, knowing air capabilities, that they have direct useful application in the course of a conflict with the Soviet Union in particular?

THE WITNESS: I think that they are vital, sir, to deterring a war, and I think that they are vital to winning a war should such a thing come. Further than this, it would seem intolerable to me that the Russians have such a weapon and the United States not. This is to get back to this area again. It would have reversed essentially our position when we had a monopoly on the atomic bomb -- not entirely, but to a large degree. Involved as we are in a non-shooting war, this could have been a tremendous defeat for the United States.

MR. GRAY: We have had testimony given to this Board by scientists who were involved in some of these discussions to the effect that thermonuclear weapons are more useful to the enemy than they are to us. By that I believe they meant to say that we are more vulnerable, assuming that both powers have these weapons, than are the Russians. Do you share that view?

THE WITNESS: Of course, it depends on the perimeters of our problem. Stated just as you have stated it, I would share that view. But think what would happen if we did not have the bomb and they did. The fact that we are troubled does not mean we should have this weapon in my view.

MR. GRAY: I may get you into a classified difficulty so let me know if I do. Is a part of your conviction that these weapons are vital to our security based on considerations of numbers of aircraft that might be involved in any use of these weapons? Is that a clear question?

THE WITNESS: Do you mean, sir, that by having these weapons fewer airplanes might be required?

MR. GRAY: That is part of it, yes. Is that an important military consideration?

THE WITNESS: It is to a degree. In order to be effective an enemy's defense must be saturated. By this there must be a certain number of attacks made to confuse and confound his defense. This establishes really the minimum number of aircraft. This is sort of "get rich quick" air tactics. Added to that is the matter of flexibility to take care of local situations. This also could require a number of aircraft. What I am trying to say is that if you have a weapon that is ten times as great as your old weapon, you cannot reduce your number of aircraft by ten automatically. There are other considerations.

MR. GRAY: I think I have only one more question. During the period with respect to which you have testified-- perhaps I should be more specific -- during the period 1947 to January 1950, did you have a serious question in your mind, based on what information you had, that the Air Force might have difficulty in developing a carrier which was capable of transporting and delivering the weapon which was under debate?

THE WITNESS: This is the atomic bomb in that period and the thermonuclear bomb coming up?

MR. GRAY: That is correct.

THE WITNESS: Of course, there was no question about carrying the atomic bomb.

MR. GRAY: Yes.

THE WITNESS: There was no question among the combat bombardiers about their ability to deliver it. There was a great deal of impassioned debate on this subject, but I have never heard a bombardment commander say he could not deliver the weapon.

MR. GRAY: This is the atomic weapon?

THE WITNESS: This is the atomic weapon. We didn't know what the size and the weight and shape of this thermonuclear weapon would be, but as soon as the President directed that we determine the feasibility of it, the Air Force went immediately into a study of deliverability, and we were prepared with a series of devices to carry it. Some of them were

not good, but they were a start. For instance, one was the B-36 drone, which is not good. Others were more modern airplanes that were coming up. We even had in the kit a design on paper that was flexible enough to fit almost any weight that we might finally find we had to lift. Specifically studied were the B-47 and the B-52 and then as a very quick short range project, the B-36 as a drone.

MR. GRAY: In October 1949, based on what you knew -- how much or how little -- about the technical difficulties in bringing about such a weapon which the Air Force might use, was there any doubt in your mind about your ability to design a plane, a carrier which would be effective?

THE WITNESS: That a plane could be designed?

MR. GRAY: Yes.

THE WITNESS: No, sir, I don't think there was any such doubt. You can design as big an airplane as you want, I am sure.

MR. GRAY: I am asking you this question because you are an airman.

THE WITNESS: Yes, sir. My answer is no, there was no doubt of the ability of the aircraft industry to design an airplane to carry almost anything. The important thing is that we get to work on it, and that we work together with the Atomic Energy Commission so that we can keep the size and shape together to come up with a good device in a timely

manner.

MR. GRAY: Dr. Evans.

DR. EVANS: General Wilson, it has been mentioned a number of times in this meeting this morning that you were a dedicated airman. I wish to state for the record that this Board does not think there is any opprobrium, and I don't think anybody in the room thinks there is any opprobrium connected with being a dedicated airman.

THE WITNESS: Thank you, sir. I invented the term

MR. SILVERMAN: If there was any suggestion that I meant any such thing, I certainly did not.

MR. GRAY: I think Dr. Evans wishes everybody here to take judicial notice that there may have been people present who may have been interested in the Army at one time.

THE WITNESS: I understand, sir.

DR. EVANS: One of the possible reasons there may have been opposition to this thermonuclear weapon was possibly that Russia had fewer targets for that thing than we had. Was that ever mentioned? It would be like killing a mosquito with a sledge hammer?

THE WITNESS: I have heard this sort of debate, but not seriously in official circles, no, sir.

DR. EVANS: Do you have an idea now that the thermonuclear weapon was developed far more quickly than you would have had reason at one time to think it might be?

THE WITNESS: Yes. I was agreeably surprised. Yes, sir.

DR. EVANS: That is all I have.

REDIRECT EXAMINATION

BY MR. ROBB:

Q General, there are a couple of questions suggested by the Chairman's questions.

We have heard some discussion here by various witnesses about tactical bombing versus strategic bombing. I wonder if you could give us a little information about what the distinction is, what the two kinds of bombing are, so we have it from somebody who knows what he is talking about?

A There is no real distinction. It is an oversimplification of terms. I think that what is meant by tactical bombing is bombing in immediate support of ground troops, something of this sort. Actually my view and the view of my school is that all bombing is directed toward a strategic goal, and that bombing done on the battlefield should be timed with bombing done against the enemy's will to resist, so that both will be mutually supporting. Short of a lecture, sir, I hope that will suffice.

Q Is the thermonuclear weapon considered to be a tactical weapon or a strategic weapon, or both?

A If you will accept my definition, which is not an accurate one, that a tactical weapon is in support of ground

troops on the battlefield, then you would assume that a thermonuclear weapon would be a strategic weapon. We don't like to use these terms. We prefer not to, because they are all directed to a strategic end.

Q Is the nuclear powered ship, using the term perhaps unprofessionally, a strategic or tactical weapon?

A For the same reason you can't differentiate. It would be a highly flexible performing airplane.

C I am talking about a ship.

A Oh, a ship. I beg your pardon. I don't think you can differentiate there either. It depends on how they are employed.

Q Is there any question, General that there are targets in Russia, and that there would be targets in the event of a war with Russia, upon which the thermonuclear weapon should be employed?

A Yes, sir.

C Beg pardon?

A Yes, sir.

Q You say there is question?

A No, there is no question. There are targets in Russia against which this weapon should be employed.

MR. ROBB: That is all.

MR. SILVERMAN: I think I have one question.



## REXCROSS EXAMINATION

BY MR. SILVERMAN:

Q I think the Chairman asked you about whether you had any question in October 1949 about the possibility of determining an aircraft large enough to carry a thermonuclear weapon. I am not sure in my own thinking. We are talking about a big hydrogen bomb?

A I understand, sir.

Q I think you said you didn't have any doubt that it could be done?

A It could be designed, yes.

Q Will you give us some idea about how long it takes from design of a plane to production?

A It varies of course. The cycle used to be about three years. When I left the business it had crept up to about five and I don't know how long it is, but it is a goodly period. That is from the drawing board to the production and rolling them off, and not a modification.

Q If it were a much bigger plane than anything that had been had before it might be presumably longer?

A It might be longer if it is from the original concept of production. If it is a modification, it is different.

Q And one couldn't tell what you needed until you saw the size and shape of the thing you had to carry?

A Yes, sir.

MR. SILVERMAN: Thank you.

MR. ROBB: Thank you, General.

MR. GRAY: Thank you very much, General Wilson.

(Witness excused.)

MR. GRAY: We will recess until 2 o'clock.

(Thereupon at 12:05 o'clock p.m., a recess was taken  
until 2:00 p.m., the same day.)

AFTERNOON SESSION

2:00 p.m.

MR. GRAY: Dr. Pitzer, do you wish to testify under oath? You are not required to do so.

DR. PITZER: I would be happy to do so if that is customary.

MR. GRAY: All the other witnesses have.

Will you raise your right hand and give me your full name?

DR. PITZER: Kenneth Sanborn Pitzer.

MR. GRAY: Kenneth Sanborn Pitzer, do you swear that the testimony you are to give the Board will be the truth, the whole truth and nothing but the truth, so help you God?

DR. PITZER: I do.

Whereupon

KENNETH SANBORN PITZER

was called as a witness, and having been first duly sworn, was examined and testified as follows:

MR. GRAY: Will you be seated, please.

It is my duty to remind you of the existence of the so-called perjury statutes. May we assume that you are familiar with them?

I should also like to request, Dr. Pitzer, if in the course of your testimony it becomes necessary for you to refer to or to disclose restricted data, you will notify me in advance, so that we may take the necessary steps in the

interests of security.

Finally, I should like to say to you that we consider this proceeding a confidential matter between the Atomic Energy Commission, its officials and witnesses on the one hand, and Dr. Oppenheimer and his representatives on the other. The Commission is making no releases to the press, and we express the hope that witnesses will take the same view.

THE WITNESS: Surely.

MR. GRAY: Mr. Robb, would you proceed.

DIRECT EXAMINATION

BY MR. ROBB:

Q Doctor, would you tell us what your present post or position is?

A My present post is professor of chemistry and Dean of the College of Chemistry, University of California at Berkeley.

Q Would you tell us something of your academic training and background, please, sir?

A My undergraduate training was at the California Institute of Technology, with a bachelor's degree and a Ph. D. at the University of California in Berkeley.

Q In what?

A Physics and chemistry; officially chemistry. My general work has been what is sometimes described as a borderline area between physics and chemistry for the most part,

although my professional affiliation has been with the Chemical Society primarily.

I am a member, indeed a fellow of the American Institute of Physics, as well as affiliated with the Chemical Society.

Q Would you say when you took your Ph. D.?

A 1937.

Q Do you know Dr. Oppenheimer?

A Certainly.

Q How long have you known him, sir?

A I at least knew of him when I was at Cal Tech in the period 1931 to '35. More personal acquaintanceship developed gradually during the period from 1935 on at Berkeley and in the later years I was, of course, a professional colleague, and I was a member of the staff in chemistry and in physics.

Q Have you ever been employed by the Atomic Energy Commission?

A Yes. I was Director of the Division of Research of the Atomic Energy Commission from approximately the beginning of 1949 to the middle of 1951.

Q You left your academic duties and came on to take that position, is that right?

A Yes, I was asked to do this. The only basis which seemed reasonable and agreeable to me was on a leave of absence basis, because I wished to maintain as a primary

career actual direct scientific work and teaching at the University.

The Commission originally asked me to come for two years and leave was arranged on that basis. As a later step it was extended for another six months.

Q When your leave was up, you went back to California?

A When my leave was up I went back to California. The only difference was that they asked me to take over the deanship. At that time I had been just professor of chemistry previously.

Q What connection have you now if any with the atomic energy program?

A My principal connection now is as consultant and affiliate of the Radiation Laboratory at the University of California, including the program at Livermore, as well as the campus.

Q Is the Livermore side Dr. Teller's laboratory?

A It is commonly known as that. I have taken special pains to be sure that the chemistry and chemical engineering program at the Livermore Laboratory was adequately staffed and in a healthy state, including the loaning of members of our departmental staff to that program.

Q I should have asked you in sequence, but I will ask you now, what were your duties as Director of Research of the Atomic Energy Commission?

A I am glad you came back to that. My line duties, as it were, concerned responsibility for basic or fundamental research in the physical sciences, including mathematics, chemistry, physics, metallurgy. In what might be described as a staff capacity, I was, shall we say, scientific advisor to other division directors, such as Production, Military Applications and in general wherever scientific -- let me say advice in the physical sciences was useful to the Commission.

Q And you undertook those duties, I believe you said, in 1950?

A No, January 1949.

Q I beg your pardon. Doctor, coming to September 1949, will you state whether or not you had any knowledge of any questions arising or interest in a so-called thermonuclear weapon about that time?

A Yes, I think it was about that time that my colleagues from Berkeley, Teller, Lawrence and Alvarez, came in in connection with some other meeting, and drew my attention particularly to the importance of a more vigorous program in this area.

Q When you say came in, you mean came to Washington?

A Yes. That is, they had come to Washington, two of them being members of another panel in some other field, and arriving the day before the meeting, came in to see me and talked about the potentialities in this area.

Q And you said their thoughts were what about it?

A Their thoughts were that this represented an important area in which the defense of the United States could be improved by a vigorous program of research and development leading to what has now become commonly termed the hydrogen bomb.

Q Was that before or after the Russian explosion?

A It was after the Russian explosion.

Q Did you thereafter have occasion to see Dr. Oppenheimer?

A The event that I recall was on a weekend, some time in October -- the exact date could be developed if desired, but I do not remember it now -- in which I had been up in that area, particularly giving an address to the Chemical Society meeting at Reading Pennsylvania, and I dropped by and visited with Dr. Oppenheimer.

Q Where?

A At his home in Princeton, or his office, too, and we discussed this subject, and also the subject of the Atomic Energy Commission fellowship program which was having certain difficulties at that time. I would not say that either one or the other was necessarily the principal reason for the visit.

Q What was said by Dr. Oppenheimer about the thermo-nuclear?

A I was very much surprised to find that he seemed



not in favor of a vigorous program in this area.

Do you recall whether or not he gave a reason for that feeling?

A I am a little vague in my memory as to the reasons and the details of the discussion then. As nearly as I can recall the reasons were substantially the same as are stated in the General Advisory Committee report of October 30, wasn't it?

Q 29th, I believe it was.

A And in particular in the appendix or substatement that was signed by Dr. Oppenheimer with others.

Q Was this occasion on which you saw Dr. Oppenheimer before or after that meeting of the GAC?

A This was before the GAC meeting. I am quite positive of that.

Q Do you recall whether or not any mention was made by Dr. Oppenheimer of the views of any other scientists?

A I am quite sure there was mention at that time of discussion or communication between Dr. Oppenheimer and Dr. Conant, and an indication that Dr. Conant was taking a view similar to that being expressed by Dr. Oppenheimer.

Q Before we go further in point of time, were you familiar at that time in the fall of 1949 with the work which was going on prior to the Russian explosion at Los Alamos in respect to the thermonuclear?

A I would not say I had a detailed acquaintanceship with that. I knew there was a small study program of some sort and that Dr. Teller was the figure that was regarded as the principal expert in the field. As I recall, he spent a portion of the time from year to year in Los Alamos. I don't recall the details. I did visit the Los Alamos Laboratory in 1949 and reviewed its program in some detail, at least in the areas of which I had particular cognizance or competence, and it was apparent that there was no extensive program in the thermonuclear field.

Q Would you say that the work that was going on was significant or otherwise in point of magnitude and intensity of effort?

A It was certainly not what you would call a vigorous program. It was a sort of very subsidiary exploration of a few people -- I don't know just how many.

Q You saw, did you, the report of the GAC of the October 29-30 meeting?

A Yes. I have forgotten just how long after it was issued.

Q Were you here in Washington at the time of that meeting?

A Yes.

Q Will you tell us whether or not you had prepared any material or any presentation to make to the Committee in

respect of the thermonuclear problem?

A No, I don't believe I had any particular presentation prepared at that time. I don't recall any such.

Q Were your views on the matter solicited by the GAC?

A I don't recall the detail, but I do not believe that they were, although I am not sure about that point. I do recall having come down at one period and then having had Carroll Wilson, then General Manager, apologize and say that the attendance at the forthcoming session was being more highly restricted than he had anticipated. At least this particular session I did not attend. I am not very clear as to the exact detail.

Q Had your views been solicited or received by the Committee on other matters?

A Oh, indeed.

Q Prior to that time?

A Yes.

Q And were they solicited on other matters subsequent to that time?

A Yes.

Q You have stated or have told us about your conversation with Dr. Oppenheimer prior to the GAC meeting and you told us about seeing the report of the GAC meeting. Were you aware subsequent to the GAC meeting of any significant change in Dr. Oppenheimer's views as he had expressed them to

you orally, and as they were expressed in the report of the GAC meeting?

A Over what period of time do you mean?

Q Any time subsequent to that.

A I am sure there was some change in detailed view, but I don't recall any marked or major or sudden change.

Q I am speaking particularly of his attitude with respect to the advisability of going ahead with the thermonuclear program. Were you aware of any significant change in that or any increase of enthusiasm?

A Certainly not any very marked increase in enthusiasm. There was no major or sudden change that I was aware of.

Q Doctor, would you say that you are pretty familiar with the nuclear scientists, physicists and chemists in the country? Are you generally familiar with them?

A I have reasonably wide acquaintanceship, more of course on the chemical side, but I am acquainted with many nuclear physicists.

Q Given Dr. Oppenheimer's attitude and feelings as you have described them, what can you tell us about what would be the effect in your opinion upon the scientific world of such attitudes and feelings so far as either increasing or decreasing enthusiasm for the thermonuclear program? That is a long question. I hope it is clear. I am trying not to lead

you.

A I hope you will permit me to make a statement of my general impressions of that time. After the President made the decision and announced it to the papers, I was rather surprised to find that Dr. Oppenheimer did not in some manner or another disqualify himself from a position of, shall we say, technical leadership of the program. I had the feeling that if my advice on a major subject of this sort had been so -- if the decision had been so much in reverse from my advice, let us put it that way -- that I would not have wanted to be in a position of responsibility with respect to the subsequent pursuit of the program.

As to just what course of action would have been most appropriate, there are various alternatives. I think this would have led to a clearer and more vigorous program had some other arrangement of this sort been had.

Q Why do you think that, Doctor?

A It would have been clear that the Commission was by this time thoroughly behind the program and that the fullest support was going to be given to it because special arrangements had been made to be sure that the leadership would be vigorous.

Q Do you think the fact that Dr. Oppenheimer stayed on entertaining the views which you have told us about discouraged other physicists from going ahead on the program with vigor?

A I can only say to this that I am afraid it may have. I am not aware of detailed negotiations or influences on particular individuals, but I do know there was difficulty in that early period in obtaining the staff that would have seemed desirable to me and as I believe Dr. Teller felt was desirable at that time, particularly in the theoretical physics area. To have had other advisory leadership that was known to be enthusiastic for the program would, I think, have assisted.

Q You suggested other advisory leadership. Did you have in mind a specific step that might have been taken either by Dr. Oppenheimer or by the Commission to get such leadership?

A As I said before, it seemed to me that there were several alternatives there. If the most extreme change had seemed desirable, there was a possibility of full changes of membership in the statutory advisory committee. Other possibilities could have been the appointment of some special panel in this field, and of course a marked and clearcut change in the viewpoints of certain individuals would have also assisted the program.

Q In your opinion did Dr. Oppenheimer do everything he might have to further the program after the President's decision?

A Again in an inferential sense, I am afraid I must say

that he did not.

Q Would you explain that to us a littlebit?

A As I indicated earlier, it seemed to me that had he enthusiastically urged men in the theoretical physics field to go to Los Alamos or other points as indicated for this program that the difficulties in staffing it would have not arisen. I am sure he had great influence over individuals in that field.

On the other hand, as I say, this is simply an inference, and not something that I know from day to day and man to man.

Q I understand. What was Dr. Oppenheimer's influence in the physics field during that period to your knowledge?

A He was unquestionably a most influential individual in dealings with other physicists, particularly theoretical physicists, but also experimental men.

Q Doctor, did there come a time when Dr. Libby was appointed to the General Advisory Committee?

A Yes.

Q Did you have anything to do with that appointment?

A I don't know how much I had to do with the appointment, but at that time I discussed problems with the then Chairman, Gordon Dean.

Q Could you give us the approximate date of that?

A I am trying to think when those appointments were

made. This must have been in the late spring or summer of 1950, I would infer.

Q Would you go ahead. I am sorry I interrupted you.

A At that time I pointed out to Mr. Dean, as I indeed had pointed out earlier, that there was a considerable body of scientific opinion of very distinguished and able men that was more enthusiastic with respect to the thermonuclear weapons program and had undoubtedly different views in a number of respects than were represented on the Advisory Committee as of that time. I urged him to appoint to that committee at least one individual who had been from the beginning enthusiastic for the thermonuclear program and who would assure him of advice based on that point of view.

Q Whom did you suggest, if anyone?

A I suggested a number of names, including Dr. W. F. Libby of the University of Chicago, and eventually Dr. Libby was pointed to the committee.

Q Was there a weapons subcommittee of the General Advisory Committee?

A I believe there was, yes.

Q Who chose that weapons subcommittee?

A I have never been a member of the committee, and I cannot state as a matter of knowledge what the committee procedure was. I presume that the selection was very likely on nomination by the Chairman and confirmation by the



committee, although it may have been by the full committee action in some other mechanism.

Q However, it was done, was Dr. Libby ever appointed to that weapons subcommittee to your knowledge?

A I don't know whether he was ever appointed to the committee, but I am substantially certain that he was not appointed to the committee in the fall of 1950.

Q There has been quite a bit of testimony here about a meeting held at Princeton, I believe, in the spring of 1951. Are you familiar with that meeting in general, and did you hear about it?

A Yes, I heard about that meeting.

Q Was Dr. Libby invited to that meeting as far as you know?

A As far as I know, he was not.

Q What can you tell us about the importance or the essentiality to the atomic weapons and the thermonuclear weapons program today of Dr. Oppenheimer, in your opinion?

A Let me develop this in a number of facets.

Q That is why I asked the broad question so you can answer it in your own way.

A I would like to discuss these briefly from three points of view. One is in terms of immediate scientific work. That is the calculations, theoretical derivations and this sort of thing. This by and large is done by younger people,

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particularly in the field of theoretical physics. I haven't the slightest doubt that Dr. Oppenheimer would be valuable to such work but, by and large, from that tradition and experience in theoretical physics, this sort of thing is done by people in their twenties or thirties.

The second aspect is that of leadership among men in this field. I have no doubt that Dr. Oppenheimer's influence and importance in the sense of leadership among men is of the highest order. He would have a great deal of influence and could be of a great deal of assistance in persuading able people to work at certain places and at certain times and in selecting people for this.

The third phase that I would mention would be that on what might be called policy advice. This is the sort of thing that the Commission and other non-technical management people need. Personally, I would not rate Dr. Oppenheimer's importance in this field very high for the rather personal reason, I suspect, that I have disagreed with a good many of his important positions and I personally would think that advisors in the policy field of greater wisdom and judgment could be readily obtained.

Q You say very honestly that you personally disagree. Let me ask you whether or not events have proved that you were right or Dr. Oppenheimer was right.

A That is a difficult question. I think personally

that we were right in going into a vigorous thermonuclear program at the time we did. I would not want to question the possibility of a perfectly sincere and reasonable judgment to the contrary at that time. I want to make it perfectly clear that I am emphasizing here essentially need, or in the extreme, indispensability of the advice than some other feature. Possibly it would be just fair to say that in the policy area, I certainly do not regard Dr. Oppenheimer as having any indispensability.

Q One final question, doctor. You are not here as a witness, are you, because you wanted to be?

A Certainly not. Thank you for asking that. I am here only at the very specific and urgent request of the General Manager and with a feeling that as one of the senior scientific personnel of the Commission at a critical time that it was only reasonable that I should accede to the General Manager's request.

Q Doctor, I am asking this next question so that the record will be plain and not intending to insinuate anything.

Although you are here at the specific request of the General Manager, your views which you have expressed are your own independent views, aren't they?

A Indeed. I am expressing only precisely my own views and I think anyone that knows me would be pretty certain that I would not express anybody else's views no matter how they

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were put.

Q In other words, the General Manager's request brought you physically here but did not give you the ideas which you expressed.

A That is correct.

MR. ROBB: That is all I care to ask, Mr. Chairman.

MR. GRAY: Mr. Silverman.

MR. SILVERMAN: Yes, sir.

CROSS EXAMINATION

BY MR. SILVERMAN:

Q I think you said that at your visit to Dr. Oppenheimer in Princeton in October of 1949, I thought you said you were rather vague as to Dr. Oppenheimer's statement of his views but that as far as you can recall, they were about the same as in what has come to be known as the majority appendix to the GAC report.

A What I believe I said was that I was surprised that he was opposing a vigorous program and that as nearly as I can recall for it were substantially those in this majority appendix.

Q Do you recall specifically that he then told you the reasons and what they were. I am not trying to trap you into anything. Or do you think it possible that you are now reading back the reasons stated in the GAC report, and they did not surprise you very much when you heard them as

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Dr. Oppenheimer's views?

A I am sure we did discuss the problem, not at great length, but at appreciable length, and that the reasons must have been offered. I frankly can't be sure exactly which argument came into the picture at which time.

Q You were asked about the extent of the thermonuclear program work that was being done in that field up to September of 1949. I think you said that you didn't think there was a very extensive program, or something of that kind?

A Yes.

Q If I am wrong, don't hesitate to correct me. It is all right. Would you say that Dr. Bradbury, who was the Director of the Laboratory at Los Alamos, was perhaps in a better position to give a statement of the extent of the thermonuclear work that was being done than you were?

A Oh, indeed. Dr. Bradbury had more detailed information concerning the size of the program, as did Dr. Teller and others.

Q Your position was Director of Research. Am I correct that weapons development or research was not part of your responsibility?

A The situation with particular respect to weapons was as follows. The line authority for the Los Alamos Laboratory and the remainder of the weapons development, as well as production program was in the Division of Military

Applications under the Directorship then of General McCormack.

My function in that area was strictly a staff function to be of whatever assistance and advice I could be since General McCormack was not himself a scientist.

Q If and when you were asked for scientific advice, you would give it, and find what you could and so on?

A Yes. In fact, I would go further. I am not particularly bashful. I would frequently make suggestions on my initiative, and I was invited to make suggestions on my initiative.

Q I am not suggesting that you were not, nor that your suggestions were not entirely welcome. I am sure they were. I am just trying to establish the lines of responsibility.

A That is correct.

Q And that in fact the development of weapons would be more a matter that perhaps General McCormack would know more about, and perhaps Dr. Bradbury would.

A In terms of the details or in General McCormack's case, the administrative side of the program, that statement would be appropriate.

Q And in terms of what was actually done in the development of the weapons.

A I wouldn't argue that.

Q I am not trying to argue with you either. I think you said that you did not think that your views were solicited by the General Advisory Committee at the time of

the October 1949 report. Do you recall whether there was a subsequent time, fairly shortly after the General Advisory Committee report, when they did solicit your views?

A As I recall there was a subsequent meeting possibly in early December, in which this subject was reviewed again. If I remember correctly, General McCormack and I were both invited to that meeting and invited to essentially speak our piece, since we were by that time believed to be in substantial disagreement with the committee. As I recall, General McCormack testified at greater length and I supported the view contrary to the committee's report briefly.

Q You said testified, spoke, I take it you mean. It was a discussion.

A Yes,

Q I think you said you were rather surprised that Dr. Oppenheimer did not disqualify himself from a position of technical leadership of a program with which he apparently disagreed. Do you know whether Dr. Oppenheimer did in fact offer to resign from the chairmanship of the General Advisory Committee at that time?

A I have no information on that.

Q You have not heard that he offered to the Chairman, Mr. Dean, to resign?

A I don't believe I heard that, no.

Q And you don't know what Mr. Dean's reaction was.

You just never heard of it?

A I never heard about it.

C I think there has been testimony here about it so I think the record is clear enough on it.

A At least, if I heard of it, I do not recall at this time.

Q I take it you would be less critical of Dr. Oppenheimer's attitude if that were the fact, if he offered to resign and was urged to remain?

A Certainly so. I think, however, that his position today would be better if he had insisted on at least some degree of disqualification in this field at that time.

Q I wish you would elaborate on that.

A Let me put it this way. I am extremely sorry to see this issue concerning advice which on hindsight proved not too good brought up in connection with a security clearance procedure. I feel very strongly that scientists should feel free to advise the government and not be held to account if their advice proves not the best afterward. This should have no relevance to security clearance procedure. If Dr. Oppenheimer had seen fit to insist upon stepping out of the position of advising on the hydrogen program this could not be introduced into this argument at this time. I am very sorry to see that it does have to come up at this time.

Q I need hardly say that I entirely agree with you.

I think you said that you thought that Dr. Oppenheimer's



attitude may have discouraged people from working on the thermonuclear program, and you were very frank in saying you didn't have details of that and so on. I suppose your greatest familiarity would be with the situation at Berkeley, would it not?

A I certainly had some degree of familiarity with the situation at Berkeley at the time I was in Washington, both because the Radiation Laboratory was more immediately under the Research Division and because of all my personal contacts with the Berkeley staff.

On the other hand, I would assure you that I took a very definite interest in this thermonuclear program and visited Los Alamos on occasion, and visited with Professor Teller and others when he was in Washington in order to see how it was going, and in order to offer my assistance at any time.

Q I think you were asked whether you thought Dr. Oppenheimer did everything he might have done to further the President's thermonuclear development program after the President's decision, and I think you said you thought he might not have. Everything that a man might have done is a relative thing.

MR. ROBB: Mr. Chairman, I hate to interrupt but it seems to me that the witness ought to do the testifying and not Mr. Silverman.

MR. SILVERMAN: That is an introduction to the question.

MR. GRAY: I think it is true that you have been expressing your views quite frequently, Mr. Silverman, in this cross examination, and I have not stopped you, again in the interest of not being too rigid in our procedures. But I think it well for me to make a request at this time that you confine your introductory statements to the necessities of the question, because the record should primarily reflect the views of witnesses, rather than counsel.

MR. SILVERMAN: I have tried to do so, sir, and I will try to be more careful of that.

MR. GRAY: Thank you.

BY MR. SILVERMAN:

Q Would you say that doing everything that one might have done is a relative matter?

A It is a relative matter, and in my earlier answer to the question I was not trying to slice close to the line. I felt that the events of that period were sufficiently wide of a narrow borderline to justify the critical statement.

Q In one sense, and I am not criticizing you, sir, you did not do everything you might have to further the program.

A No. There are things on hindsight one can always figure out one could have done more. I suppose one could have

done many things differently, but I certainly carried it as a high priority among my duties, particularly considering that it was not a line, but rather a staff problem, and I regarded the program since as something that demanded my attention whenever anything substantial could be contributed to it.

Q You didn't consider that it was necessary for you not to return to the University, for instance?

A No. But I delayed the return for six months very substantially on that account.

Q Believe me, I am not criticizing you, sir. I think you are entirely within your rights. You have taken the position as a consultant which I take it is a part time position.

A Yes, I think since you are pursuing this matter, I would like to say a little further that I am not myself a nuclear physicist. The chief contributions which I can make to this program are to be sure that the chemical engineering components that need to go into the various units are made to the exact specifications that are required, and so on. My position is the administrative position in chemistry at the University of California at Berkeley, and I have thought my best contribution would be to see that the proper people were working on the proper jobs at the proper time, rather than I should necessarily go and do them with my own hands.

Q Don't you think, sir, that the decision as to how

much of one's own efforts and time one puts into some program is a matter for personal judgment of a man?

A Yes, I was considering these judgments earlier in very appreciable degree with respect to the adequacy of staffing of a given program and the ability of a particular person to take steps to assure that the program was adequately staffed. In my own position the sort of thing I could do was to essentially say, "Look, Mr. So-and-so, we will get along without you in the department, half time or full time, next semester. This is an extremely urgent job." Or someone not associated with the University initially, but in my general field I can advise him of the importance of the program and urge him strongly to serve if offered an appropriate position. It is in this frame of reference that my earlier comments were made.

Q Don't you think that service on the General Advisory Committee is itself quite an important contribution?

A It is indeed an important position.

Q Returning to your statement that you thought that you thought Dr. Oppenheimer's attitude may have discouraged people from working on the thermonuclear program, there of course have been other factors in the difficulty of getting staff, were there not?

A There are always other factors. The question is the relative importance of this task as compared to others, and

the sense of urgency which is imparted to a man who is considering either going to this program or not going to the program.

Q I think you said that you saw no marked increase in Dr. Oppenheimer's enthusiasm as to going ahead with the hydrogen bomb. Was that during the period you were here?

A Yes, that was during the period I was in Washington. I have seen Dr. Oppenheimer only most infrequently since I left Washington.

Q When did you leave Washington?

A This was the summer of 1951.

Q Are you in a position to say as to whether his enthusiasm increased with the later improved outlooks for the feasibility of the hydrogen bomb?

A I am not in a position to say anything about that.

Q You referred to the appointment of Dr. Libby to the General Advisory Committee. I think you said that Dr. Libby was one of a number of names that you had suggested. Do you know that Dr. Libby was on a list that Dr. Oppenheimer submitted to Chairman Dean for membership on the General Advisory Committee?

A I have no knowledge of that.

Q Before you came to your position with the Atomic Energy Commission as Director of Research, did Dr. Oppenheimer have a conversation with you in which he urged you or asked you

whether you would be willing to spend some time in government work in Washington?

A It is very likely that this was the case. I am not sure.

Q In your testimony earlier about a meeting at Princeton -- there have been so many meetings at Princeton, I am talking about the weekend you spent at Princeton when you spoke to Dr. Oppenheimer about the hydrogen bomb program in the fall of 1949, and also the fellowship program.

MR. ROBB: I don't think he spent a weekend there.

MR. SILVERMAN: As long as we have the time. As to the length of time, it doesn't matter. I am making no point about it being a weekend at all.

BY MR. SILVERMAN:

Q What was the fuss about the fellowship program?

A This is a long story. The essence of it was that the Congress of the United States introduced a rider in the Appropriation Act which required investigation and a decision as to loyalty for all fellows under the program in the future.

Q What was your view on that?

A I was very sorry to see such a requirement introduced into the program.

Q Was Dr. Oppenheimer's view in accord with your s on that?

A In that general way, yes. I was sorry to see it introduced. I was equally sorry and disturbed by the events and situations which had come to the attention of the Congress and which led them to introduce it.

Q Were you against this requirement?

A As I say, I was opposed to the introduction of a requirement for full investigation. I was hoping that the situation could be handled by some loyalty oath or some other procedure which would not require a full field investigation, but which would still give a case of reasonably substantial certainty of loyalty to the United States.

I might add that this was the course taken with respect to the National Science Foundation later.

Q Were you critical of the work of the Reactor Safeguard Committee?

A Yes, I have been critical of that

Q Do you recall who the chairman of that committee was during the period when you were critical of it?

A Surely. My good friend Edward Teller. I have argued with him in a friendly fashion on many times.

Q And you don't for a moment question his good faith and what he did there?

A Not at all.

MR. SILVERMAN: Thank you.

MR. GRAY: Dr. Pitzer, are you familiar with the

exchange of letters between General Nichols and Dr. Oppenheimer? Have you read them?

THE WITNESS: I have read that double page spread in the New York Times, which contains I believe what you are referring to.

MR. GRAY: I suppose that was accurate. I never checked it. I would like to read you a part of General Nichols' letter. This is in a paragraph which in its entirety related to the hydrogen bomb, starting about the middle of the paragraph:

"It was further reported that even after it was determined as a matter of national policy to proceed with development of a hydrogen bomb, you continued to oppose the project and declined to cooperate fully in the project."

That is a sentence in that paragraph. In order to get a clearer view of your opinion in my own mind, may I assume it is an accurate reflection of your testimony that this suggestion is not borne out by your understanding of events, that is, you have not testified that Dr. Oppenheimer continued to oppose the project?

THE WITNESS: I am forced to say that my impressions of that period were more consistent with the hypothesis that he was still personally opposing the project than with the hypothesis that he had made a major change in his views and was now strongly supporting the project.



MR. GRAY: I suppose there is a difference of finding oneself in personal opposition and finding oneself opposing. I must say I had not thought of a distinction of this sort in this language until this moment. But I would like to know what you feel. Let us assume that this means actively opposed as distinguished from holding to personal views in opposition. Is that a clear distinction in your mind?

THE WITNESS: I must admit that I am likewise trying to make a finer distinction than I thought about commonly before. What I mean to say is essentially this: I have no personal knowledge of Dr. Oppenheimer going to Mr. X and saying don't work at Los Alamos, or of his making a technical recommendation obviously and distinctly contrary to the demonstrable good of the program.

On the other hand, I have great difficulty believing that the program would have had certain difficulties that it did have at that time if he had enthusiastically urged individuals to participate in the program, because as I said before, he was a great personal influence among theoretical physicists at that time. I am afraid the distinction is primarily one of ignorance.

MR. GRAY: It is clear that you have said that you feel that Dr. Oppenheimer failed to encourage people or did not encourage people -- I don't mean to use a word that is loaded-- did not encourage people to work on the project.

You have said you didn't know of any instances in which he actively sought to discourage people from working on the project.

THE WITNESS: At least not at this time. Part of my impressions may have carried over from instances known in greater detail at a date nearer the time of events.

MR. GRAY: You could not name anyone that you thought had failed to work on the project because of Dr. Oppenheimer's persuasive powers?

THE WITNESS: I know, for example, there was much discussion about Hans Bethe at that time. It is entirely plausible to me that had Dr. Oppenheimer encouraged Dr. Bethe he might have very likely entered the program actively at that time. This is supposition. I was certainly not present at the conversations between Dr. Bethe and Dr. Oppenheimer. I mention Dr. Bethe in part by way of example.

MR. GRAY: Would you return for a moment to the second GAC meeting in late 1949 -- I have forgotten when that was. December, I think.

THE WITNESS: I believe so.

MR. GRAY: At which time you and General McCormack were invited to present your views to the General Advisory Committee. I believe you said that General McCormack spoke at some length and you supported his views. What was General McCormack's view and yours at the time? What was expressed to

the GAC as well as you recall it?

THE WITNESS: My recollection is rather vague of that particular time, and I am somewhat reluctant to try to put words in General McCormack's mouth after this lapse, but the view that I believe I would have been attempting to present at that time was essentially the one, that one could not improve the national defense by remaining in ignorance in an area where there are developments of potentially very great importance to the national defense. I was unable to see how a policy of intentionally not pursuing a vigorous program could possibly be consistent with optimum defense of the country.

MR. GRAY: You referred to what you supported as a more vigorous program than was in effect at that time. It is clear that the General Advisory Committee recommended in October and again in December against an all out production effort of the so-called Super. That was clearly one of the recommendations, as I understand it.

THE WITNESS: Yes.

MR. GRAY: I would like to put to you a question I have put to other witnesses with very little success, and it may be my ignorance or just my failure to ask a question properly. In your judgment was there something that the GAC could have recommended at this time which was sort of an all out production program but more than was recommended?

THE WITNESS: Oh, indeed; obviously, to me.

MR. GRAY. Was that your position at the time, or were you for the all out production? You see I am a little confused when you say a more vigorous program.

THE WITNESS: Let me put it this way. I was for a very vigorous program, one which would have the highest possible priority, subject to reasonable continuation of other important programs. In other words, I was not in favor of stopping a lot of other important activities, but I was thoroughly convinced that the necessary manpower could be recruited, the necessary facilities provided, for a very vigorous program of the general nature that was being discussed and advocated at that time by Dr. Lawrence and Dr. Teller and others. I believe I said at that time -- I am sure I felt -- that this business of a crash program was largely what we called a straw man. In other words, it seems to me that the General Advisory Committee was clearly in a position to have recommended a program of intermediate intensity if such had been their judgment.

The recommendations that were actually made, as you gentlemen have them, are almost entirely negative in character. They are in terms of not doing this and not doing that.

MR. GRAY: The reason I started to smile is I think you answered my question, the question I have been trying to ask, at least you have given me your opinion about it, and you made it clear to me that perhaps there is a valid

distinction, at least in your mind, between something that was all out and something that was more vigorous than was then in progress.

May I turn now to another thing about which you testified very briefly, Dr. Pitzer. You referred to your unhappiness with respect to events that led up to Congressional action in attaching the rider to the appropriation bill. What are these events that you have in mind?

THE WITNESS: The sequence began with a young man by the name of Freistad.

MR. GRAY: I didn't mean to bring my university into this hearing.

THE WITNESS: I am sorry; the facts are that way.

MR. GRAY: I honestly did not know this is what you were talking about.

THE WITNESS: He was first essentially exposed and discussed as essentially, I believe, an admitted Communist and holding a fellowship. Hearing were held and there was a great deal of discussion in the press, and as it were, one thing went on to another, until, the Senate in due time attached this rider to the bill and the House accepted it.

MR. GRAY: Prior to this time when the Congress established the requirement which you found yourself unhappy about, did you participate in any kind of discussions with respect to what should be required of these fellows in the

way of disclosure of political affiliations as we seem to refer to them in this hearing?

THE WITNESS: Yes. There were discussions within the Commission at that time. I have forgotten exactly the details. I certainly participated in such discussions.

MR. GRAY: Would the GAC have participated in this kind of discussion? You, of course, were not a member of the GAC.

THE WITNESS: I don't recall the chronology. This fellowship business happened pretty fast, and I rather doubt if there happened to occur a GAC meeting in that period. I believe I recall that the then Chairman, Mr. Lilienthal, got in contact with Dr. Oppenheimer and possibly other members of the GAC by telephone -- they may have come to Washington specially -- and it may have been that a meeting was held, but I don't recall such.

MR. GRAY: Let us leave the GAC out of it at this point and let me approach it from another angle the thing that I am trying to get clear in my mind.

There were discussions, I assume, in which a suggestion was made that there should be no inquiry put to an Atomic Energy Commission fellow with respect to his political affiliations. This was the view of some people at that time, is that correct?

THE WITNESS: I believe such views were held at that

time.

MR. GRAY: My question is this: Was this the view of the Commission at that time, or could the Commission be said to have had a view?

THE WITNESS: I don't believe the Commission could be said to have had a view at that time. At least if as a Commission it reached any decision, I am not aware of it now.

MR. GRAY: I don't think I will pursue that any further, Dr. Pitzer. Dr. Evans?

DR. EVANS: Dr. Pitzer, you said you were not a nuclear physicist, is that right?

THE WITNESS: That is correct.

DR. EVANS: Would you call yourself a physical chemist or a physicist?

THE WITNESS: I would call myself a physical chemist, yes, sir.

DR. EVANS: I want to ask you if you met a man in recent years, a graduate student of Cal Tech, by the name of Sheehan? It is one of my students that I sent out there. I thought he was particularly brilliant. He got a Ph. D. degree.

THE WITNESS: I have met, I believe, casually a young Sheehan, but I don't know enough about his background to complete the identification with certainty.

DR. EVANS: Have you met any Communists in the course

of your career, that you knew were Communists?

THE WITNESS: It may well have happened. They didn't have Communist labels pinned on them at the time.

DR. EVANS: They don't often have, do they?

THE WITNESS: No, they don't often have.

DR. EVANS: Did you know David Hawkins?

THE WITNESS: The name is familiar to me. If I ever met him, I do not recall it.

DR. EVANS: Did you know Bernie Peters?

THE WITNESS: Again if I ever met him personally, I do not recall it, although I recall very vividly the case of getting him a passport to India that took a definite Commission action, so that his name is definitely familiar to me.

DR. EVANS: Did you know Fuchs?

THE WITNESS: I don't believe I ever knew Fuchs, or ever met him. I knew of him from the scientific literature.

DR. EVANS: I have no further questions.

#### REDIRECT EXAMINATION

BY MR. ROBB:

Q Doctor, is it or is it not true in your opinion that in the case of a scientist as influential as Dr. Oppenheimer a failure to lend enthusiasm and vigorous support to a program might constitute hindrance to the program or opposition to the program?

A There is a certain element of semantics in that



question, but I would say yes.

MR. ROBB: Thank you.

RE-CROSS EXAMINATION

BY MR. SILVERMAN:

Q I think I have just one more question. You testified about the difficulty of obtaining staff on the thermonuclear program. I think you indicated that Dr. Oppenheimer was not helpful. Is Dr. Karplus at Cal Tech?

A I believe so.

Q Do you know whether he is a man that Dr. Oppenheimer recommended to go there?

A I don't know the details.

Q He is or has been from time to time a temporary member of the Institute for Advanced Study, has he not?

A As I say, I am not familiar with the details in that case. The staffing at Livermore in the physics area has been in the very able hands of Ernest Lawrence and other physicists, including Edward Teller. I simply have not felt it necessary or needful to pay attention to details in that area.

MR. SILVERMAN: That is all.

MR. ROBB: That is all.

MR. GRAY: Thank you very much, Dr. Pitzer.

(Witness excused.)

MR. GRAY: We will recess now, gentlemen, for a few minutes.

MR. GRAY: Dr. Teller, do you wish to testify under oath?

DR. TELLER: I do.

MR. GRAY: Would you raise your right hand and give me your full name?

DR. TELLER: Edward Teller.

MR. GRAY: Edward Teller, do you swear that the testimony you are to give the Board shall be the truth, the whole truth, and nothing but the truth, so help you God?

DR. TELLER: I do.

Whereupon

EDWARD TELLER

was called as a witness, and having been first duly sworn, was examined and testified as follows:

MR. GRAY: Will you sit down.

Dr. Teller, it is my duty to remind you of the existence of the so-called perjury statutes with respect to testifying in a government proceeding and testifying under oath. May I assume that you are generally familiar with those statutes?

THE WITNESS: I am.

MR. GRAY: May I ask, sir, that if in the course of your testimony it becomes necessary for you to refer to or to disclose restricted data, you let me know in advance, so that we may take appropriate and necessary steps in the

interests of security.

Finally, may I say to you that we consider this proceeding a confidential matter between the Atomic Energy Commission, its officials and witnesses on the one hand, and Dr. Oppenheimer and his representatives on the other. The Commission is not effecting news releases with respect to these proceedings, and we express the hope that witnesses will take the same view.

Mr. Robb.

DIRECT EXAMINATION

BY MR. ROBB:

Q Dr. Teller, may I ask you, sir, at the outset, are you appearing as a witness here today because you want to be here?

A I appear because I have been asked to and because I consider it my duty upon request to say what I think in the matter. I would have preferred not to appear.

Q I believe, sir, that you stated to me some time ago that anything you had to say, you wished to say in the presence of Dr. Oppenheimer?

A That is correct.

Q May I ask you, sir, to tell the Board briefly of your academic background and training.

A I started to study in Budapest where I was born, at the Institute of Technology there, chemical engineering for

a very short time. I continued in Germany, first in chemical engineering and mathematics, then in Munich for a short time, and finally in Leipzig in physics, where I took my doctor's degree.

After that I worked as a research associate in Goettingen, I taught in London. I had a fellowship, a Rockefeller fellowship in Copenhagen.

In 1935 I came to this country and taught for six years at the George Washington University, that is, essentially until the beginning of the war.

At that time I went to Columbia on leave of absence, partly to teach and partly in the very beginnings of the war work in 1941-42, as I remember, and then I participated in the war work. After the war I returned to teach in Chicago at the University of Chicago, which also was interrupted with some work for the AEC, and now for the last year I am at the University of California in Berkeley.

Q Dr. Teller, you know Dr. Oppenheimer well, do you not?

A I have known Dr. Oppenheimer for a long time I first got closely associated with him in the summer of 1942 in connection with atomic energy work. Later in Los Alamos and after Los Alamos I knew him. I met him frequently, but I was not particularly closely associated with him, and I did not discuss with him very frequently or in very great detail matters outside of business matters.

Q To simplify the issues here, perhaps, let me ask you this question: Is it your intention in anything that you are about to testify to, to suggest that Dr. Oppenheimer is disloyal to the United States?

A I do not want to suggest anything of the kind. I know Oppenheimer as an intellectually most alert and a very complicated person, and I think it would be presumptuous and wrong on my part if I would try in any way to analyze his motives. But I have always assumed, and I now assume that he is loyal to the United States. I believe this, and I shall believe it until I see very conclusive proof to the opposite.

Q Now, a question which is the corollary of that. Do you or do you not believe that Dr. Oppenheimer is a security risk?

A In a great number of cases I have seen Dr. Oppenheimer act -- I understood that Dr. Oppenheimer acted -- in a way which for me was exceedingly hard to understand. I thoroughly disagreed with him in numerous issues and his actions frankly appeared to me confused and complicated. To this extent I feel that I would like to see the vital interests of this country in hands which I understand better, and therefore trust more.

In this very limited sense I would like to express a feeling that I would feel personally more secure if public matters would rest in other hands.

Q One question I should have asked you before, Dr. Teller. Are you an American citizen, sir?

A I am.

Q When were you naturalized?

A In 1941.

Q I believe you said that about 1941 you began to work on the atomic bomb program.

A I don't think I said that. Certainly I did not intend to say it.

Q I will rephrase the question. When did you begin to work on the atomic bomb program?

A That again I am not sure I can answer simply. I became aware of the atomic bomb program early in 1939. I have been close to it ever since, and I have at least part of the time worked on it and worried about it ever since.

Q Did you work during the war at Los Alamos?

A I did.

Q When did you go there, sir?

A In April 1943.

Q What was the nature of your work there?

A It was theoretical work connected with the atomic bomb. Generally speaking -- I do not know whether I have to go into that in any detail -- I was more interested by choice and also by directive in advanced development, so that at the beginning I think my work was perhaps more closely connected with the actual outcome or what happened in Alamogordo, but

very soon my work shifted into fields which were not to bear fruition until a much later time.

Q Will you tell the Board whether or not while you were in Los Alamos in 1943 or 1944, you did any work or had any discussions about the so-called thermonuclear weapon?

A Excuse me, if I may restate your question. I got to Los Alamos in early April 1943. To the best of my recollection, although I might be wrong -- I mean my date might not be quite precise -- I left at the beginning of February 1946.

Throughout this period I had very frequent discussions about thermonuclear matters.

Q Will you tell us whether you ever discussed the thermonuclear method with Dr. Oppenheimer?

A I discussed it very frequently indeed with him. In fact my discussions date back to our first association in this matter, namely, to the summer of 1942.

Q What was Dr. Oppenheimer's opinion in those discussions during those years about the feasibility of producing a thermonuclear weapon?

A This is something which I wish you would allow me to answer slightly in detail, because it is not an easy question.

Q Yes, sir.

A I hope that I can keep my answer in an unclassified way. I hope I am not disclosing a secret when I say that to construct the thermonuclear bomb is not a very easy thing,

and that in our discussions, all of us frequently believed it could be done, and again we frequently believed it could not be done. I think that Dr. Oppenheimer's opinions shifted with the shifting evidence. To the best of my recollection before we got to Los Alamos we had all of us considerable hopes that the thermonuclear bomb can be constructed. It was my understanding that these hopes were fully shared by Dr. Oppenheimer.

Later some disappeared and perhaps to counterbalance some things that might have been said, I think I have made myself some contributions in discovering some of these difficulties.

I clearly remember that toward the end of the war Dr. Oppenheimer encouraged me to go ahead with the thermonuclear investigations. I further remember that in the summer of 1945, after the test at Alamogordo it was generally understood in the laboratory that we are going to develop thermonuclear bombs in a vigorous fashion and that quite a number of people, such as the most outstanding, like Fermi and Bethe, would participate in it.

I also know that very shortly after the dropping of bombs on Japan this plan was changed and to the best of my belief it was changed at least in good part because of the opinion of Dr. Oppenheimer that this is not the time to pursue this program any further.



I should like to add to this, however, that this also thoroughly responded to the temper of the people in the laboratory, most of whom at that time understandably and clearly and in consonance with the general tempo of the country wanted to go home.

Q Did you have any conversations with Dr. Oppenheimer at or about September 1945 about working on the thermonuclear?

A We had around that period several conversations and in one of them, to the best of my recollection, Oppenheimer and Fermi and Allison and I were present. Oppenheimer argued that this is not the time, at which to pursue the business further, that this is a very interesting program, that it would be a wonderful thing if we could pursue it in a really peaceful world under international cooperation, but that under the present setup this was not a good idea to go on with it.

I perhaps should also like to mention that to the best of my knowledge at that time, there was a decision by a board composed of several prominent people, one of them Dr. Oppenheimer, which decided in effect that thermonuclear work either cannot or should not be pursued, that it at any rate was a long term undertaking requiring very considerable effort. To my mind this was in sharp contrast to the policy pursued a short time before.

But I also should say that this sharp contrast was

at least in part motivated by the fact that in Los Alamos there was a crew of exceedingly able physicists who could do a lot and at the end of the war were trying to get back to their purely academic duties, and in this new atmosphere it might have appeared indeed hard to continue with such an ambitious program.

One member of the board which made this decision, Fermi, and who concurred in that decision, told me about that decision and told me that he knew that I am likely to disagree with it, and asked me to state my opinion in writing. This I did, and I gave my written statement to Oppenheimer, and therefore both the opinion that the thermonuclear bomb at that time was not feasible, and my own opinion that one could have proceeded in this direction are documented.

Q Did there come a time when you left Los Alamos after the war?

A That is right. As I mentioned, I left in February 1946. May I perhaps add something here if we are proceeding in a chronological manner?

Q Yes.

A Perhaps if I might interject this not in response to one of your questions.

Q That is perfectly all right, sir.

A I would like to say that I consider Dr. Oppenheimer's direction of the Los Alamos Laboratory a very outstanding

achievement due mainly to the fact that with his very quick mind he found out very promptly what was going on in every part of the laboratory, made right judgments about things, supported work when work had to be supported, and also I think with his very remarkable insight in psychological matters, made just a most wonderful and excellent director.

Q In that statement were you speaking of Dr. Oppenheimer's ability as an administrator or his contribution as a scientist or both?

A I would like to say that I would say in a way both. As an administrator he was so busy that his purely scientific contributions to my mind and in my judgment were not outstanding, that is, not in so far as I could see his original contributions. But nevertheless, his scientific contributions were great by exercising quick and sound judgment and giving the right kind of encouragement in very many different cases. I should think that scientific initiative came from a great number of other excellent people whom Oppenheimer not alone but also to a very great extent by his able recruiting effort he collected a very considerable number of them, and I should say that purely scientific initiatives and contributions came from many people, such like, for instance, von Neumann, Bethe, Segre, to mention a few with whom I am very closely connected, and very many others, and I cannot begin to make a complete list of them.

Coming back to a previous question, Doctor, you say you did leave the laboratory in January 1946?

A I believe February 1946, but it might be the last days of January. I do not remember so accurately.

Q Would you tell us whether or not before that happened you had any conversations with Dr. Bradbury and Dr. Oppenheimer about the question of whether you should leave or not?

A I had several conversations.

Q Would you tell us about those conversations?

A Of this kind. I am not at all sure that I can mention them all to you. One was to the best of my recollection in August of 1946, at which time the laboratory was still apparently going at full tilt. Dr. Oppenheimer came to see me in my office.

Q You said August 1946.

A August 1945. Thank you very much for catching this mistake.

He had a long conversation with me from which it became clear to me that Dr. Oppenheimer thought that the laboratory would inevitably disintegrate, and that there was not much point in my staying there, at least that is how I understood him. I had been planning to go to Chicago where I was invited to go, and participate in teaching and research work, which I was looking forward to. Then somewhere during the fall of 1945, I believe, Bradbury asked me to take on the

job of heading the Theoretical Division.

I was very much interested in seeing the continuation of Los Alamos in a vigorous manner, and in spite of my desire to go back to academic work, I considered this very seriously. I asked Bradbury about the program of the laboratory and in effect I told him -- I certainly do not remember my words -- that I would stay if one or two conditions would be met, not both, but one of them. Either if we would continue with the fission program vigorously and as a criterion whether we would do that or not, I said let us see if we could test something like 12 fission weapons per year, or, if instead we would go into a thorough investigation of the thermonuclear question.

Bradbury, I think realistically, said at that time that both of these programs were unfortunately out of the question. I still did not say no. Oppenheimer was going to come and visit the laboratory shortly after, and I wanted to discuss it with him,

I asked him or I told him that Bradbury had invited me, and asked him whether I should stay. Oppenheimer said that I should stay and he also mentioned that he knows that General Groves is quite anxious that I should. Then I mentioned to him the discussion with Bradbury. I said something to this effect. This has been your laboratory. This is your laboratory. It will not prosper unless you support it, and I don't want to stay here if the laboratory won't

prosper.

C If what?

A If the laboratory will not prosper. I think I said, I know that there can be no hard and fast program now, but I would like to know whether I can count on your help in getting a vigorous program somewhere along the lines I mentioned established here.

Again I am sorry I cannot quote any literal reply by Oppenheimer, but my recollection of his reply was that it meant that he is neither able nor willing to help in an undertaking of this kind. I thereupon said that under these conditions I think I better leave the laboratory.

Oppenheimer's statement was that he thought that this was really the right decision, and by leaving the laboratory at that time, I could be of greater service to the atomic energy enterprise at a later period.

I remember having seen Oppenheimer the same evening at some party. I forget in whose house it was. He asked me then whether having made up my mind, I don't feel better, and I still remember that I told him that I didn't feel better. But that was where the matter rested at that time.

I think this tied in more or less with my general impression that Oppenheimer felt at least for one year after the laboratory that Los Alamos cannot and probably should not continue, and it is just as wise and correct to abandon it.

I am exceedingly glad that due to the very determined action of Bradbury, who was not deterred by any prophesies of this kind, the laboratory was not abandoned, because I am sure had that been done, we would be now in a much worse position in our armament race than we happen to be.

Q Do you recall any remark by anybody to the effect that the laboratory should be given back to the Indians?

A I heard this statement attributed to Oppenheimer. I do not remember that he ever said so to my hearing.

Q Thereafter, you did in fact leave Los Alamos, Doctor?

A I left Los Alamos, but I did go back very frequently as a consultant.

Q Where did you go from Los Alamos?

A To the University of Chicago.

Q When you went back as a consultant what was the particular problem you were working on?

A Actually I have been working on quite a number of problems as required. I, of course, continue to be very much interested in the thermonuclear development, and I did continue to work on it, as it were, parttime. This, however, at that time was a very minor portion of the enterprise of the laboratory. I would say that on the average between 1945 and 1949 -- I don't know -- a very few people worked on it steadily. I would not be able to say whether this number was three or four or five or six out of a thousand or more than

a thousand in the laboratory. But this was the order of magnitude, and therefore popularly expressing and crudely expressing the state of affairs, in spite of my working there and in spite of some reports being issued, I can say that the work was virtually at a standstill.

Those were also the years when after some initial hesitation, the testing program was resumed. I understand that this resumption of the testing program was encouraged by the General Advisory Committee on which Oppenheimer was the Chairman. I was also a little bit involved in planning the first extensive test after the war. I don't mean now the Bikini test, but the following one, which I think was called Sandstone. So I would like to say that even the fraction of the time which was considerably less than one half, which was one third, it perhaps was not even as much as one third, I was spending at Los Alamos. Perhaps one third of my time went into Atomic Energy Commission work, and this was divided between thermonuclear work and other supporting work for Los Alamos, and work on an appointment which I got on the recommendation, I believe, of the General Advisory Committee, on the safety of reactors.

So I would say that of my own time a really small fraction has gone into thermonuclear development during those years and that altogether the effort was very, very slow, indeed.

Q You were familiar with the effort that was being put



in at Los Alamos in respect of thermonuclear?

A I was.

Q Doctor, let me ask you for your opinion as an expert on this question. Suppose you had gone to work on thermonuclear in 1945 or 1946 -- really gone to work on it -- can you give us any opinion as to when in your view you might have achieved that weapon and would you explain your opinion?

A I actually did go to work on it with considerable determination after the Russian bomb was dropped. This was done in a laboratory which at that time was considerably behind Los Alamos at the end of the war. It is my belief that if at the end of the war some people like Dr. Oppenheimer would have lent moral support, not even their own work -- just moral support -- to work on the thermonuclear gadget, I think we could have kept at least as many people in Los Alamos as we then recruited in 1949 under very difficult conditions.

I therefore believe that if we had gone to work in 1945, we could have achieved the thermonuclear bomb just about four years earlier. This of course is very much a matter of opinion because what would have happened if things had been different is certainly not something that one can ever produce by any experiment.

C That is right.

A I think that statements about the possible different course of the past are not more justified but only less hazardous

than statements about the future.

Q Doctor, it has been suggested here that the ultimate success on the thermonuclear was the result of a brilliant discovery or invention by you, and that might or might not have taken five or ten years. What can you say about that?

A I can say about it this. If I want to walk from here to that corner of the room, and you ask me how long it takes to get there, it depends all on what speed I am walking with and in what direction. If I start in that direction I will never get there, probably. It so happened that very few people gave any serious thought in this country to the development of the thermonuclear bomb. This was due to the fact that during the war we were much too busy with things that had to be done immediately in order that it should be effective during the war, and therefore not much time was left over.

After the war the people who stayed in Los Alamos, few and discouraged as they were, had their hands full in keeping the laboratory alive, keeping up even the knowledge of how to work on the simple fission weapons. The rest of the scientists were, I think, equally much too busy trying to be very sure not to get into an armament race, and arguing why to continue the direction in which we had been doing due to the war would be completely wrong. I think that it was neither a great achievement nor a brilliant one. It just had to be

done. I must say it was not completely easy. There were some pitfalls. But I do believe that if the original plan in Los Alamos, namely, that the laboratory with such excellent people like Fermi and Bethe and others, would have gone after the problem, probably some of these people would have had either the same brilliant idea or another one much sooner.

In that case I think we would have had the bomb in 1947. I do not believe that it was a particularly difficult thing as scientific discoveries go. I do not think that we should now feel that we have a safety as compared to the Russians, and think it was just necessary that somebody should be looking and looking with some intensity and some conviction that there is also something there.

Q Is this a fair summary --

A May I perhaps say that this again is an attempt at appreciating or evaluating a situation, and I may be of course quite wrong, because this is clearly not a matter of fact but a matter of opinion.

Q Is this a fair summary of your opinion, Doctor, that if you don't seek, you don't find?

A Certainly.

Q Do you recall when the Russians exploded their first bomb in September 1949? Do you recall that event?

A Certainly.

Q Will you tell the Board whether or not shortly thereafter you had a conversation with Dr. Oppenheimer about the thermonuclear or about what activity should be undertaken to meet the Russian advance?

A I remember two such conversations. One was in the fall and necessarily superficial. That was just a very few hours after I heard, returning from a trip abroad, that the Russians had exploded an A bomb. I called up Oppenheimer who happened to be in Washington, as I was at that time, and I asked him for advice, and this time I remember his advice literally. It was, "Keep your shirt on."

Perhaps I might mention that my mind did not immediately turn in the direction of working on the thermonuclear bomb. I had by that time quite thoroughly accepted the idea that with the reduced personnel it was much too difficult an undertaking. I perhaps should mention, and I think it will clear the picture, that a few months before the Russian explosion I agreed to rejoin Los Alamos for the period of one year on leave of absence from the University of Chicago.

I should also mention that prior to that Oppenheimer had talked to me and encouraged me to go back to Los Alamos, and help in the work there. I also went back to Los Alamos with the understanding and with the expectation that I shall just help along in their normal program in which some very incipient phases of the thermonuclear work was included, but

nothing on a very serious scale.

I was quite prepared to contribute mostly in the direction of the fission weapons. At the time when I returned from this short trip abroad, and was very much disturbed about the Russian bomb, I was looking around for ways in which we could more successfully speed up our work and only after several weeks of discussion did I come to the conclusion that no matter what the odds seemed to be, we must at this time -- I at least must at this time put my full attention to the thermonuclear program.

I also felt that this was much too big an undertaking and I was just very scared of it. I was looking around for some of the old crew to come out and participate in this work. Actually if anyone wanted to head this enterprise, one of the people whom I went to visit, in fact the only one where I had very strong hopes, was Hans Bethe.

Q About when was this, Doctor?

A To the best of my recollection it was the end of October.

Q 1949?

A Right. Again I am not absolutely certain of my dates, but that is the best of my memory. I can tie it down a little bit better with respect to other dates. It was a short time before the GAC meeting in which that committee made a decision against the thermonuclear program.

After a somewhat strenuous discussion, Bethe, to the best of my understanding, decided that he would come to Los Alamos and help us. During this discussion, Oppenheimer called up and invited Bethe and me to come and discuss this matter with him in Princeton. This we did do, and visited Oppenheimer in his office.

When we arrived, I remember that Oppenheimer showed us a letter on his desk which he said he had just received. This letter was from Conant. I do not know whether he showed us the whole letter or whether he showed us a short section of it, or whether he only read to us a short section. Whichever it was, and I cannot say which it was, one phrase of Conant's sticks in my mind, and that phrase was "over my dead body", referring to a decision to go ahead with a crash program on the thermonuclear bomb.

Apart from showing us this letter, or reading it to us, whichever it was, Oppenheimer to the best of my recollection did not argue against any crash program. We did talk for quite a while and I could not possibly reproduce the whole argument but at least one important trend in this discussion -- and I do not know how relevant this is -- was that Oppenheimer argued that some phases of exaggerated secrecy in connection with the A bomb was perhaps not to the best interests of the country, and that if he undertook the thermonuclear development, this should be done right from the

first and should be done more openly.

I remember that Bethe reacted to that quite violently, because he thought that if we proceeded with thermonuclear development, then both -- not only our methods of work -- but even the fact that we were working and if possible the results of our work should be most definitely kept from any public knowledge or any public announcement.

To the best of my recollection, no agreement came out of this, but when Bethe and I left Oppenheimer's office, Bethe was still intending to come to Los Alamos. Actually, I had been under the impression that Oppenheimer is opposed to the thermonuclear bomb or to a development of the thermonuclear bomb, and I don't think terribly much direct evidence to base this impression on. I am pretty sure that I expressed to Bethe the worry, we are going to talk with Oppenheimer now, and after that you will not come. When we left the office, Bethe turned to me and smiled and he said "You see, you can be quite satisfied. I am still coming."

I do not know whether Bethe has talked again with Oppenheimer about that or not. I have some sort of a general understanding that he did not, but I am not at all sure that this is true.

Two days later I called up Bethe in New York, and he was in New York at that time, and Bethe then said that he thought it over, and he had changed his mind, and he

was not coming.

I regretted this very much, and Bethe actually did not join work on the thermonuclear development until quite late in the game, essentially to put on the finishing touches.

I do not know whether this sufficiently answers your question.

Yes, sir. Then, Doctor, the record here shows that on October 29 and 30, 1949, the GAC held its meeting, and thereafter reported its views on the thermonuclear program, Did you later see a copy of the report of the GAC?

A I did.

Q Would you tell us the circumstances under which you saw that?

A Immediately following the meeting, the decision of the General Advisory Committee was kept very strictly confidential. I have seen at least one member of the committee namely, Fermi, who in spite of our very close relationships and the general support of my work in Los Alamos and his knowledge of my almost desperate interest in the undertaking, said that for the time being he just could not even give me an indication of what is happening except from the general tenor of his remarks it was clear that whatever decisions were reached were not terribly favorable to a crash program.

I sort of understood that some kind of action or discussion was under way which can proceed properly only if



it is kept in the very smallest circles. This, also, of course, became known in Los Alamos, and caused quite a bit of worry there.

After passage of a little while - and I do not know how much time, but I would say roughly two weeks -- the secretary of the General Advisory Committee, Dr. Manley, who also was associate director in Los Alamos, returned to Los Alamos. He called me into his office and showed me both the majority and minority report of the General Advisory Committee, and in showing me these reports, he used words which I at least at that time interpreted as meaning that Oppenheimer wanted me to see these reports, which I thought was kind. My general understanding was that these reports were also shown to something like half a dozen or dozen of the senior people in the laboratory.

At any rate, the contents of the report were known without my telling it to people. It was just public knowledge among the senior people practically then and there. Of course I was just most dreadfully disappointed about the contents of the majority and minority reports, which in my eyes did not differ a great deal.

I also should say that in my opinion the work in Los Alamos was going to be most seriously affected by the action of the General Advisory Committee, not only as an official body, but because of the very great prestige of the

people who were sitting on it. Therefore, it seemed to me at that time, and it also seems to me now entirely proper that this document should have been made available in Los Alamos.

Q Doctor, in what way did you think that the work would be affected by the report?

A I would say that when I saw the report, I thought that this definitely was the end of any thermonuclear effort in Los Alamos. Actually I was completely mistaken. The report produced precisely the opposite effect.

Q Why?

A Immediately, of course, it stopped work because we were instructed not to work, but it gave people in Los Alamos much greater eagerness to proceed in this direction and from discussions I had in Los Alamos in the following days, I gathered the following psychological reaction:

First of all, people were interested in going on with the thermonuclear device because during the war it had been generally understood that this was one of the things that the laboratory was to find out at some time or other. It was a sort of promise in all of our minds.

Another thing was that the people there were a little bit tired -- at least many, particularly of the younger ones -- of going ahead with minor improvements and wanted to in sort of an adventurous spirit go into a new field. However,

I think the strongest point and the one which was a reaction to this report was this: Not only to me, but to very many others who said this to me spontaneously, the report meant this. As long as you people go ahead and make minor improvements and work very hard and diligently at it, you are doing a fine job, but if you succeed in making a really great piece of progress, then you are doing something that is immoral. This kind of statement stated so bluntly was not of course made in the report. But this kind of an implication is something which I think a human being can support in an abstract sense. But if it refers to his own work, then I think almost anybody would become indignant, and this is what happened in Los Alamos, and the result was that I think the feeling of people in consequence of this report turned more toward the thermonuclear development than away from it.

Q You mean it made them mad.

A Yes.

Q Doctor, in the absence of the President's decision of January, would that anger have been effective?

A No.

Q Let us go back for a moment --

A There is no doubt about it. The laboratory just could not put aside a major fraction of its effort on a program of this kind unless we were going to be instructed to do it. Actually, I am pretty sure the anger in a way would

have been effective in that more people would have been willing to put aside a little part of their time and worry about it and think about it, and so perhaps it would have been a little effective. But I think that still would have been a very slow and painful progress and probably even now we would be just nowhere.

Q Dr. Manley has submitted an affidavit here to the effect that he showed you those reports as a result of an impending visit to Los Alamos by Chairman McMahon, Chairman of the Joint Congressional Committee on Atomic Energy. Would you comment on that, and tell us just what it was that Dr. Manley said that gave you the impression that it was Dr. Oppenheimer who wanted you to see the report and tell us whether or not Dr. Manley's remarks were susceptible of the interpretation that it was Chairman McMahon who wanted you to see them?

A I must say this is possible. To the best of my recollection I was even struck at that time by these words, Manley said something of that kind, that our Chairman, or the Chairman, I don't know which, sends his regards and wants you to see this. Now, this is to the best of my recollection and I don't remember that Oppenheimer's name was mentioned. At that time I interpreted this as meaning that it was the Chairman of the General Advisory Committee, that is Oppenheimer. I am quite sure that Manley did not say explicitly that it was

McMahon, and to refer to him as simply Chairman would seem to me to be a little remarkable. However, Manley has been showing this document to quite a few people and perhaps in repeating the phrase a few times parts of the phrase got dropped off. I interpreted it at that time as meaning that Oppenheimer wanted me to see the document. I think it is not excluded that it was Senator McMahon who wanted me to see the document, and if Manley says this, then it must be so.

Q Did you know Senator McMahon?

A Yes.

Q Let me ask you whether or not in that conversation with Manley he mentioned Senator McMahon by name.

A To the best of my memory, no. I do remember that Senator McMahon came out shortly afterwards. I believe I heard about his visit only later, but I might be mistaken.

Q On the subject of Senator McMahon, will you tell the Board whether or not you had proposed to see Senator McMahon about the thermonuclear matter?

A I did.

Q When was that?

A This was quite shortly after the meeting of the General Advisory Committee.

Q Did you see him?

A I did.

Q Did you have any conversation with Dr. Manley before

you saw him?

A I did.

Q Tell us about that.

A I had two conversations with him; the one which I think is more relevant, and which certainly strikes more clearly in my mind was a telephone conversation. This was after the meeting of the General Advisory Committee. I was on my way from Los Alamos to Washington. The main purpose of my visit was to see Senator McMahon. On the way I stopped in Chicago and saw Fermi in his office. It was at that time that I got the impression which I mentioned to you earlier. During my conversation with Fermi Manley called and asked me not to see Senator McMahon. I asked why. He said, that it would be a good idea if the scientists presented a united front -- I don't know whether he used that word -- I think what he really said was something of this kind, that it would be unfortunate if Senator McMahon would get the impression that there is a divided opinion among the scientists, or something of that kind. I said I had an appointment with Senator McMahon and I wanted to see him. Manley insisted that I should not. Thereupon I made the suggestion that I would be willing to call up Senator McMahon and tell him that I had been asked not to see him, and for that reason I would not see him.

At that point Manley -- I don't know whether I said to Manley that I had been asked by him or whether I would

just say I had been asked -- and thereupon Manley said, "All right, you better go and see him." That was essentially the contents of my discussion with Manley over the phone.

When I arrived in Washington, Manley met me at the station. I had already the feeling from the discussion with Fermi that at least Fermi's private feelings were not for a crash program. I knew what was in the wind, but I did not know what the decision was. Manley had originally in Los Alamos agreed that we should proceed with the thermonuclear weapon. At least that was my clear understanding.

He received me on the station with these words, "I think you sold me a gold brick." I remember this particularly clearly, because my familiarity with the English language not being excellent, I did not know what he meant, and I had to ask him what a gold brick is, which he proceeded to explain.

Q What did he explain, Doctor?

A A brick covered with gold fill which is not as valuable as it looks.

Q What did you understand him to refer to?

A To the thermonuclear program which in my opinion was what we should do, what would be the effective way for us to behave in that situation. Manley implied that in the discussions of the General Advisory Committee, another proposal emerged, which was much better, much more hopeful, a better

answer to the Russian proposals -- excuse me, to the Russian developments -- he however would not tell me what it was.

I was a little mystified. I then went to see Senator McMahon. He did not tell me what was in the report of the General Advisory Committee, but he used some very strong words in connection with it, and did so before I had opened my mouth, words to the effect, "I got this report and it just makes me sick" or something of that kind.

I did then say that I hoped very much that there would be some way of proceeding with the thermonuclear work and Senator McMahon very definitely said that he will do everything in his power that it should become possible.

Q What was your purpose in seeing Senator McMahon?

A May I say very frankly I do not remember. One of my purposes I am quite sure was a point not connected with the thermonuclear development. It was this, that at some earlier time -- I am not sure whether it was a year or earlier or when -- Senator McMahon was in Los Alamos at the time when I was visiting there. I had an opportunity to talk to him. Senator McMahon asked me to talk with him and he asked me what I thought would be the best method to increase effectiveness of Los Alamos. I made a few general remarks at that time, which I do not recall, but I remember very clearly that Senator McMahon asked me a question which I answered and the answer to which question I regretted later.



It was whether the salary scale in Los Alamos was adequate.

Later, when I got a little bit closer back and talked with people, I felt that I had given the wrong answer and I wanted to correct this, and therefore I wanted to see Senator McMahon. However, by the time I actually went to see him, the thermonuclear discussion had gone, as I have indicated, to a point where it was perfectly clear to me that I wanted to talk with him about that question and certainly even by the time I left Los Alamos and before Manley's telephone conversation, I fully hoped to discuss this matter with him because by that time it was quite clear to me that this was one of the very important things that was going on in Los Alamos. This is to the best of my recollection. But I am not at all sure. It may even be possible that I had seen Senator McMahon about another matter at an earlier time. I believe, however, that all this took place in the same conversation.

Q In January 1950, the President decided that we should go ahead with the thermonuclear program. Do you recall that?

A I do.

Q After that decision was announced, did you go to work on the thermonuclear?

A I most certainly did.

Q Was the program accelerated?

A It was.

Q What was done in general to accelerate it?

A A committee was formed which for a strange and irrelevant reason was called a family committee.

Q Who was on that committee?

A I was the chairman and there were a number of people representing various divisions in the laboratory, and this committee was in charge of developing some thermonuclear program and within a very short time this committee made a number of proposals directed toward some tests which were to give us information about the behavior of some phenomena which were relevant.

At the same time I exerted all possible effort and influence to persuade people to come to Los Alamos to work on this, particularly serious because theoretical work was very badly needed.

Q What was done in respect of the number of personnel working on the thermonuclear? Was it increased, and if so, how much?

A It was greatly increased. As I say prior to that there was at most half a dozen people working on it. I am not able to tell you how many people worked on the thermonuclear program in that period. I would say that very few people worked on it really full time. I am sure I didn't work on it full time although in that time the major portion of my effort was directed toward the thermonuclear work.

I believe that Los Alamos has prepared an official estimate in response to a question, and that would be, I think, the best source of how many people worked on the thermo-nuclear program at that time. I would guess, but as a very pure guess, and I should not be surprised if that document would disprove me, that the number of people working on the thermo-nuclear program increased then to something like two, three, or four hundred, which still was something like ten, twenty, or perhaps a little more per cent of the laboratory's effort. Perhaps it was closer to 20 per cent. I might very easily be mistaken.

Q At all events it was a very large increase.

A It was a very large increase. As compared to the previous one it was just between standing still and starting to go.

Q Did you at or about that time, that is, shortly after the President's decision, have any discussion with Oppenheimer as to whether or not he would assist you?

A I had two discussions with him, but one was shortly before. I would like to quote it a little. Actually the time when President Truman made the announcement I happened to be in Los Angeles and was planning to stay there, in fact had accepted an appointment at UCLA which I at that time had to postpone at any rate because I saw this in the paper. You see, I was not going to stay in Los Alamos much longer, and the

fact that there came this announcement from President Truman just changed my mind. Prior to the announcement, preceding it perhaps by two or three days, I saw Dr. Oppenheimer at an atomic energy conference concerning another matter, and during this meeting it became clear to me that <sup>in</sup> Dr. Oppenheimer's opinion a decision was impending and this decision would be a go ahead decision.

At that time I asked Oppenheimer if this is now the decision, would he then please really help us with this thing and help us to work, recalling the very effective work during the war. Oppenheimer's answer to this was in the negative. This was, however, very clearly before President Truman's decision. However, I also should say that this negative reply gave me the feeling that I should not look to Oppenheimer for help under any circumstances.

A few months later, during the spring, I nevertheless called up Oppenheimer and I asked him not for direct help, but for help in recruiting people, not for his own work but for his support in recruiting people. Dr. Oppenheimer said then, "You know in this matter I am neutral. I would be glad, however, to recommend to you some very good people who are working here at the Institute," and he mentioned a few. I wrote to all of these people and tried to persuade them to come to Los Alamos. None of them came.

Q Where were those people located?

A At the Institute of Advanced Study in Princeton.

Q Where has been some testimony here that a scientist named Longmire came down to Los Alamos to assist you with the cooperation of Dr. Oppenheimer. Do you recall whether he came down there before the H bomb conference or afterwards?

A I should like to say first of all that Dr. Longmire did help in the H bomb development and helped very effectively indeed. I should say helped in fission work and in the thermonuclear work, and is now one of the strongest members of Los Alamos. He came before all this happened. I remember that I tried to get him on the recommendation of Bethe some time early in 1949. I also remember that a little later in the spring or early in the summer I learned -- I think it was in May -- that Longmire had declined an invitation to Los Alamos, and I also learned that the salary offered him was some 20 per cent less than the salary I had recommended. I thereupon talked with the appropriate people in Los Alamos and got them to make a second offer to Longmire at the original salary level and after I secured agreement on that, I called up Longmire and told him that we can offer him this salary and would he please come. Longmire said yes. He would come. However, he had accepted an invitation in the meantime at the Institute of Advanced Study and he now no longer could change his mind. Thereupon I said, "Well, what about it if I try to get this chance? Come with us anyway for a year. After a

year you can go back to the Institute. I will talk to Oppenheimer about this." Longmire said, "If Oppenheimer will agree to this, I will consider coming very seriously."

I thereupon called up Oppenheimer on the phone, and at least I believed I approached him directly, I am not sure, somebody approached him, but I think I did it directly, and I remember on that occasion Dr. Oppenheimer was exceedingly cooperative and did give whatever formal assurances he could give. It was not terribly formal. He gave assurances that after a year if Longmire wanted to come back to the Institute, he would be very welcome, and if he wants to go to Los Alamos, that is a very good idea, and so on, and after this was arranged, Longmire did come.

Q This was when?

A This was all, however, before anyone of us dreamed about the Russian explosion. That was in the early summer or late spring of 1949. I should also say that after Longmire got to Los Alamos, he not only worked effectively, but liked it so much that then on his own choice he really just stayed there, and is still there, although in the meantime he also taught for certain periods in Rochester, I believe, or in Cornell.

Q Except for giving you this list of names that you have told us about of people all of whom refused to come, did Dr. Oppenheimer after the President's decision in January 1950

assist you in any way in recruiting people on the thermonuclear project?

A To the best of my knowledge not in the slightest.

Q After the President's decision of January 1950, did Dr. Oppenheimer do anything so far as you know to assist you in the thermonuclear project?

A The General Advisory Committee did meet, did consider this matter, and its recommendations were in support of the program. Perhaps I am prejudiced in this matter, but I did not feel that we got from the General Advisory Committee more than passive agreement on the program which we evolved. I should say passive agreement, and I felt the kind of criticism which tended to be perhaps more in the nature of a headache than in the nature of enlightening.

I would like to say that in a later phase there is at least one occurrence where I felt Dr. Oppenheimer's reaction to be different.

Q Would you tell us about that?

A I will be very glad to do that. In June of 1951, after our first experimental test, there was a meeting of the General Advisory Committee and Atomic Energy Commission personnel and some consultants in Princeton at the Institute for Advanced Study. The meeting was chaired by Dr. Oppenheimer. Frankly I went to that meeting with very considerable misgivings, because I expected that the General Advisory

Committee, and particularly Dr. Oppenheimer, would further oppose the development. By that time we have evolved something which amounted to a new approach, and after listening to the evidence of both the test and the theoretical investigations on that new approach, Dr. Oppenheimer warmly supported this new approach, and I understand that he made a statement to the effect that if anything of this kind had been suggested right away he never would have opposed it.

Q With that exception, did you have any indication from Dr. Oppenheimer after January 1950 that he was supporting and approving the work that was being done on the thermonuclear?

A My general impression was precisely in the opposite direction. However, I should like to say that my contacts with Oppenheimer were infrequent, and he might have supported the thermonuclear effort without my knowing it.

Q When was the feasibility of the thermonuclear demonstrated?

A I believe that this can be stated accurately. On November 1, 1952. Although since it was on the other side of the date line, I am not quite sure whether it was November 1st our time or their time.

Q What?

A I don't know whether it was November 1st Eniwetok time or Berkeley time. I watched it in Berkeley.

Q Did you have a conversation with Dr. Oppenheimer in the summer of 1950 about your work on the thermonuclear?



A To the best of my recollection he visited Los Alamos in the summer of 1950 and then in the early fall the General Advisory Committee met in Los Alamos -- I mean he visited in Los Alamos early in the summer, and then they met in Los Alamos some time I believe in September, and on both occasions we did talk.

Q What did Dr. Oppenheimer have to say, if anything, about the thermonuclear?

A To the best of my recollection he did not have any very definite or concrete advice. Whatever he had tended in the direction that we should proceed with the theoretical investigations, which at that time did not look terribly encouraging, before spending more money or effort on the experimental approach, which I think was at that time not the right advice, because only by pursuing the experimental approach, the test approach, as well as the theoretical one did we face the problem sufficiently concretely so as to find a more correct solution. But I also should like to say that the opinion of Dr. Oppenheimer given at that time to my hearing was not a very decisive or not a very strongly advocated opinion, and I considered it not helpful, but also not as anything that need worry us too much.

I must say this, that the influence of the General Advisory Committee at that time was to the best of my understanding in the direction of go slow, explore all

completely all the designs before looking into new designs, do not spend too much on test programs, all of which advice I consider as somewhat in the nature of serving as a brake rather than encouragement.

Q Doctor, I would like to ask for your expert opinion again.

In your opinion, if Dr. Oppenheimer should go fishing for the rest of his life, what would be the effect upon the atomic energy and the thermonuclear programs?

A You mean from now on?

Q Yes, sir.

A May I say this depends entirely on the question of whether his work would be similar to the one during the war or similar to the one after the war.

Q Assume that it was similar to the work after the war.

A In that case I should like to say two things. One is that after the war Dr. Oppenheimer served on committees rather than actually participating in the work. I am afraid this might not be a correct evaluation of the work of committees in general, but within the AEC, I should say that committees could go fishing without affecting the work of those who are actively engaged in the work.

In particular, however, the general recommendations that I know have come from Oppenheimer were more frequently, and I mean not only and not even particularly the thermonuclear

case, but other cases, more frequently a hindrance than a help, and therefore, if I look into the continuation of this and assume that it will come in the same way, I think that further work of Dr. Oppenheimer on committees would not be helpful.

Q What were some of the other recommendations to which you referred?

A You want me to give a reasonably complete list? I would be glad to.

Q Yes.

A And not distinguish between things I know of my own knowledge and things I know from hearsay evidence?

Q Yes.

MR. ROBB: May I go off the record just a moment?

(Discussion off the record.)

MR. GRAY: We will take a short recess.

gfls

(The last question and answer preceding the recess were read by the reporter.)

BY MR. ROBB:

Q Doctor, in giving your answer, I wish you would give the Board both those items that you know of your own knowledge and the others, but I wish you would identify them as being either of your own knowledge or on hearsay.

A Actually, most of them are on some sort of hearsay. I would like to include not only those things which have occurred in committee but also others.

I furthermore felt that I should like at least to make an attempt to give some impression of the cases in which Dr. Oppenheimer's advice was helpful. His first major action after the war was what I understand both from some part of personal experience and to some extent of hearsay, as I have described, his discussions which led at least to some discouragement in the continuation of Los Alamos. I think that it would have been much better if this had not happened.

Secondly, Oppenheimer published shortly after in connection with the Acheson-Lilienthal Report a proposal or supported a proposal, I do not know which, which was based on his scientific authority to share denatured plutonium with others with whom we might agree on international control. I believed at that time and so did many others that denaturing

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plutonium is not an adequate safeguard. I believe that this is today even clearer than it was at that time.

One of the first actions of the General Advisory Committee -- this is hearsay --

Q Excuse me, doctor. Have you finished your discussion of the other matter?

A I intended to have it finished but I will be glad to stop and answer questions.

Q Let me ask a question in that connection as to whether or not Dr. Oppenheimer either at that time or subsequently recommended some inspection of the Russian atomic plants.

A My understanding is that inspection was an integral part of the Acheson-Lilienthal Report, and that, in turn, Dr. Oppenheimer had very actively participated in drafting this report.

I should like to say that in my personal opinion -- perhaps I should have said that right away -- the Acheson-Lilienthal proposal was a very good one, would have been wonderful had it been accepted, and the inspection to my mind was a very important portion of it. I did not follow these things very closely but I believe it was something with which Dr. Oppenheimer had also agreed or recommended. Whichever the case was, if I am not mistaken in this matter, I really should include that among the very valuable things

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he did after the war.

Q Excuse me, and now go ahead.

A Thanks for bringing up this matter.

One of the first actions of the General Advisory Committee was to advise that reactor work at Oak Ridge should be discontinued and that reactor work should be concentrated at the Argonne Laboratory in Chicago. That was recommended, as I understand, by a great majority.

I also understand that Fermi opposed this recommendation. All this is hearsay evidence but of the kind which I heard so often and so generally that I think it can be classed as general knowledge within AEC circles.

Now, I should like to say that it appeared to many of us at the time, and I think it has been proved by the sequel, that this recommendation was a most unfortunate one.

It set our reactor work back by many years. Those exceedingly good workers who left -- the great majority of those very good workers who left Oak Ridge -- did not find their way into the Argonne Laboratory but discontinued to work on atomic energy matters or else worked in a smaller group on the side very ineffectively. The very small and determined group which then stayed behind in Oak Ridge turned out in the long-run as good work as the people at the Argonne Laboratory, and I feel that again being a little bit uncertain of what would have happened if this recommendation had not been

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and would not have been accepted, we would be now a couple of years ahead in reactor development. I would like to count this as one of the very great mistakes that have been made.

I understand, having finished with this one, that among the early actions of the General Advisory Committee was, after it was decided that Los Alamos should go on, to recommend strong support for Los Alamos and particularly for the theoretical group. I understand that Oppenheimer supported this and I again think that this was helpful. I have a little personal evidence of it, although it is perhaps somewhat presumptuous of me to say so, that Oppenheimer was active in this direction, for instance, by advising me unambiguously to go back at least for a limited period. I know similarly that in that period he helped us to get Longmire. I also have heard and have heard in a way that I have every reason to believe that in a number of minor but important details in the development of fission weapons, Oppenheimer gave his expert advice effectively, and this included the encouragement of further tests when these things came along.

Q Tests on what?

A Tests of atomic bombs, of fission bombs.

Now, the next item is very definitely in the hearsay category, and I might just be quite wrong on it, but I have

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heard that Dr. Oppenheimer opposed earlier surveillance, the kind of procedures --

MR. SILVERMAN: I did not understand. Opposed what?

THE WITNESS: Earlier surveillance, the sort of thing which was designed to find out whether or not the Russians have detonated an atomic bomb. If this should prove to be correct, I think it was thoroughly wrong advice. Then I think generally the actions of the General Advisory Committee were adverse to the thermonuclear development, but to what extent this is so and why I believe that it is so, we have discussed and I do not need to repeat any of that.

Finally, when, about three years ago, the question arose whether this would be a good time to start a new group of people working in a separate laboratory, along similar lines as Los Alamos and competing with Los Alamos, the General Advisory Committee, or the majority of the General Advisory Committee and in particular Dr. Oppenheimer, was opposed to this idea, using again the argument which was used in the case of Oak Ridge, that enough scientific personnel is not available. In this matter I am personally interested, of course, and I was on the opposite side of the argument and I believe that Dr. Oppenheimer's advice was wrong. Of course, it is quite possible that his advice was right and mine was wrong. In the meantime, however, we did succeed in



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recruiting quite a capable group of people in Livermore. I think this is essentially the extent of my knowledge, direct or indirect in the matter. I think it would be proper to restrict my statements to things in close connection with the Atomic Energy Commission and to disregard advice that I heard that Oppenheimer has given to other agencies like the Armed Forces or the State Department. This would be hearsay evidence of a more shakey kind than the rest.

BY MR. ROBB:

Q Doctor, the second laboratory, is that the one in which you are now working at Livermore?

A That is one at which I had been working for a year and at which I am now working part time. I am spending about half my time at the University of California in teaching and research and half my time in Livermore.

Q Did you have any difficulty recruiting personnel for that laboratory?

A Yes, but not terribly difficult.

Q Did you get the personnel you needed?

A This is a question I cannot really answer, because it is always possible to get better personnel. But I am very happy about the people whom we did get and we are still looking for very excellent people if we can get them, and I am going to spend the next three days in the Physical Society in trying to persuade additional young people to join

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Q Numerically at least, you have your staff; is that right?

A I would say numerically we certainly have a staff but I do not think this answer to the question is relevant. It is always the question of whether we have the right sort of people and I do believe we have the right sort of people.

Q Is that laboratory concerned primarily with thermonuclear weapons or is that classified?

A To the extent that I can believe what I read in Time Magazine, it is not classified, but I would like to say that my best authority on the subject is Time Magazine.

Q What does Time Magazine about it?

MR. SILVERMAN: Well--

MR. ROBB: I will skip that.

BY MR. ROBB:

Q I will ask you this, doctor: Will you tell us whether or not the purpose of establishing a second laboratory was to further work on the thermonuclear?

A That was a very important part of the purpose.

MR. ROBB: Mr. Chairman, that completes my direct examination, and it is now 5:30.

MR. GRAY: I think we had better ask the witness to return tomorrow morning at 9:30.

MR. GARRISON: Mr. Chairman, we only have one or

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two questions.

THE WITNESS: I would be very glad to stay for a short time.

MR. GRAY: I have some questions, but I do not think it will take too long, and if you only have a few--

MR. SILVERMAN: We have so very few, I am almost tempted not to ask them.

#### CROSS EXAMINATION

BY MR. SILVERMAN:

Q You were just testifying about the Livermore Laboratory.

A Right.

Q Did Dr. Oppenheimer oppose the Livermore Laboratory as it was finally set up?

A No. To the best of my knowledge, no.

Q His opposition was to another Los Alamos?

A It was to another Los Alamos, and when the Atomic Energy Commission, I think, on the advice from the military did proceed in the direction, the General Advisory Committee encouraged in particular setting up a laboratory at the site where it was set up. But prior to that, I understand that the General Advisory Committee advised against it.

Q That is when there was a question of another Los Alamos?

A Right.

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Q Doctor Teller, when was Livermore set up in its present form?

A This is something which is more difficult --

Q You think that is classified?

A No. It is more difficult to answer than the question of when a baby is born because it is not born all at once. I think the contracts were signed with the Atomic Energy Commission sometime in July, 1952. There was a letter of intent sent out earlier and the work had started a little before that. Actually, we moved to Livermore on the second of September 1952 and work before that was done in Berkeley.

Q Do you now have on your staff at Livermore some people who had been or who are members of the Institute for Advanced Study? I am thinking particularly of Dr. Karplus.

A The answer is no. Dr. Karplus has been consulting with us for a period. He has accepted an invitation to the University of California and he is maintaining his consultant status to the Radiation Laboratory in general, of which Livermore is a part. I believe, but this is again a prediction about the future and my expectation, that Dr. Karplus in the future will help us in Livermore by consulting, but I also believe that for the next couple of years, if I can predict his general plans at all and I talked a bit with him, this is likely not to be terribly much because he will have to adjust

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himself to the new surroundings first.

Q Do you know whether Dr. Oppenheimer recommended that Dr. Karplus go to work at Livermore?

A I have no knowledge whatsoever about it. It is quite possible that he did.

MR. SILVERMAN: I have no further questions.

MR. GRAY: Dr. Teller, I think earlier in your testimony you stated that in August, 1945, Dr. Oppenheimer talked with you and indicated his feeling that Los Alamos would inevitably disintegrate. I believe those were your words, and that there was no point in your staying on there. Is my recollection correct?

THE WITNESS: Yes. I am not sure that my statement was very fortunate, but I am pretty sure that this is how I said it.

MR. GRAY: Would you say that his attitude at that time was that it should disintegrate?

THE WITNESS: I would like to elaborate on that for a moment. I think that I ought to say this: I do not like to say it. Oppenheimer and I did not always agree in Los Alamos, and I believe that it is quite possible, probably, that this was my fault. This particular discussion was connected with an impression I got that Oppenheimer wanted me particularly to leave, which at first I interpreted as his being dissatisfied with the attitude I was taking about certain

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questions as to how to proceed in detail. It became clear to me during the conversation -- and, incidentally, it was something which was quite new to me because prior to that, while we did disagree quite frequently, Oppenheimer always urged no matter how much we disagreed in detail I should certainly stay and work. He urged me although on some occasions I was discouraged and I wanted to leave. On this occasion, he advised me to leave. I considered that at first as essentially personal matters. In the course of the conversation, it became clear to me that what he really meant at that time -- I asked him -- we disagreed on a similar thing and I forget the thing, but I do remember asking him in a similar discussion that, three months ago-- "You told me by all means I should stay. Now you tell me I should leave." He said, "Yes," but in the meantime we had developed these bombs and the work looks different and I think all of us would have to go home -- something to that effect. It was at that time that I had the first idea that Oppenheimer himself wanted to discontinue his work very rapidly and very promptly at Los Alamos. I knew that changes were due but it did not occur to me prior to that conversation that they were due quite that rapidly and would affect our immediate plans just right then and there. I do not know whether I have made myself sufficiently clear or not.

I failed to mention this personnel element before.

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I am sorry about that. I think it is perhaps relevant as a background.

MR. GRAY: Do you think that Dr. Bradbury has been an effective director of the Los Alamos Laboratory?

THE WITNESS: I am quite sure of that.

MR. GRAY: It is my impression that he was selected by Dr. Oppenheimer. Do you know about that?

THE WITNESS: I heard that statement. I also heard the statement that it was General Groves who recommended Bradbury. I have not the least information upon which to decide which of these statements or whether any of these statements are correct. Perhaps both of them are correct.

MR. GRAY: It could be. Were you aware of the presence of any scientists on the project following the January 1950 decision who were there for the purpose of proving that this development was not possible rather than proving that it was possible?

THE WITNESS: I certainly would not put it that way. There have been a few who believed that it was not possible, who argued strongly and occasionally passionately for it. I do not know of any case where I have reason to suspect intellectual dishonesty.

MR. GRAY: Excuse me, Dr. Teller. I would like the record to show that it was not my intention to impute intellectual dishonesty to anybody, but you have no knowledge

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of this.

**THE WITNESS:** I would like to say that on some visits when Bethe came there, he looked the program over someway critically and quite frankly he said he wished the thing would not work. But also he looked it over carefully and whatever he said we surely agreed. In fact, we always agreed.

**MR. GRAY:** Yes, I think that clears it up perhaps.

You talked with Dr. Fermi soon after the October 1949 meeting of the GAC, and whereas he was not at liberty to tell you what the GAC decided, you got the impression that they were not favorable to a crash program, as you put it.

**THE WITNESS:** Actually, Dr. Fermi gave me his own opinion, and this was an essential agreement with the GAC. This discouraged me, of course. He also gave me the impression that the GAC really decided something else, something essentially different.

**MR. GRAY:** You subsequently saw the GAC report?

**THE WITNESS:** I did.

**MR. GRAY:** Is my impression correct that the tenor of the report was not altogether only a question of not moving into a crash program but was opposed to the development of the weapon altogether.

**THE WITNESS:** This was my understanding. In fact,



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that is definitely my recollection.

MR. GRAY: Now, Dr. Teller, you stated that the GAC report stopped work at Los Alamos. I assume you meant work on thermonuclear devices.

THE WITNESS: I said that and may I correct it, please. What I really should have said was prevented the start of work because work really did not get started.

MR. GRAY: I think that is important because I thought I heard you say that you instructed not to work. What you mean is that you were instructed not to start anything new.

THE WITNESS: That is correct. I am sorry if I expressed erroneously.

MR. GRAY: Was a result of the GAC report that the six or eight or ten or whatever it was people who were then working, did they stop their work?

THE WITNESS: No, certainly not. In fact, there was an increase of people working right then and there, which was in the relatively free community. Not all of this work was directed in this relatively free atmosphere. It was evident that some work would continue. It was quite clear that in the period November-December-January, we did do some work and more than we had done earlier. However, we did not make a jump from, let us say, six people to 200, but we made a jump of from six people to 12 or 20. I could not

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tell you which.

MR. GRAY: Dr. Teller, General Nichols' letter to Dr. Oppenheimer, which I assume you have some familiarity with --

THE WITNESS: I read it. That is, I read the New York Times. If that is assumed to be a correct version --

MR. GRAY: As far as I know, it is correct. There is one sentence which reads as follows:

"It was further reported that you departed from your proper role as an advisor to the Commission by causing the distribution, separately and in private, to top personnel at Los Alamos of the majority and minority reports of the General Advisory Committee on development of the hydrogen bomb for the purpose of trying to turn such top personnel against the development of the hydrogen bomb."

If this conversation you had with Dr. Manley about which you have testified and in which he referred to our chairman or the chairman was the source of this report, am I right in assuming that your testimony is that you are not prepared to say that Dr. Oppenheimer did cause the distribution of this?

THE WITNESS: My testimony says that I cannot ascertain that Dr. Oppenheimer caused distribution. I have presented in this matter all that I can remember.

MR. GRAY: Dr. Teller, you are familiar with the

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question which this Board is called upon to answer, I assume.

THE WITNESS: Yes, I believe so.

MR. GRAY: Let me tell you what it is and invite counsel to help me out if I misstate it. We are asked to make a finding in the alternative, that it will or will not endanger the common defense and security to grant security clearance to Dr. Oppenheimer.

I believe you testified earlier when Mr. Robb was putting questions to you that because of your knowledge of the whole situation and by reason of many factors about which you have testified in very considerable detail, you would feel safer if the security of the country were in other hands.

THE WITNESS: Right.

MR. GRAY: That is substantially what you said?

THE WITNESS: Yes.

MR. GRAY: I think you have explained why you feel that way. I would then like to ask you this question: Do you feel that it would endanger the common defense and security to grant clearance to Dr. Oppenheimer?

THE WITNESS: I believe, and that is merely a question of belief and there is no expertness, no real information behind it, that Dr. Oppenheimer's character is such that he would not knowingly and willingly do anything that is designed to endanger the safety of this country. To the

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extent, therefore, that your question is directed toward intent, I would say I do not see any reason to deny clearance.

If it is a question of wisdom and judgment, as demonstrated by actions since 1945, then I would say one would be wiser not to grant clearance. I must say that I am myself a little bit confused on this issue, particularly as it refers to a person of Oppenheimer's prestige and influence. May I limit myself to these comments?

MR. GRAY: Yes.

THE WITNESS: I will be glad to answer more questions about it to you or to counsel.

MR. GRAY: No, I think that you have answered my question. I have, I think, only one more.

I believe there has been testimony given to this Board to the effect -- and again I would like the assistance of counsel if I misstate anything -- that the important and significant developments in the thermonuclear program since January of 1950 have indeed taken place at Los Alamos and not at Livermore. Am I wrong in stating that?

MR. ROBB: Somebody said that.

MR. GRAY: Do you recall?

MR. SILVERMAN: My recollection is that there was testimony that the important developments in the thermonuclear bomb which have thus far been tested out and which were the subject of the recent tests were developed at Las Alamos.

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I think that was the testimony.

MR. GRAY: Will you assume that we have heard something of that sort? Do you have a comment?

THE WITNESS: Is there a ruling that I may answer this question in a way without affecting security? I would like to assume that. I think I should.

MR. ROLANDER: If you have any worry on that point, perhaps the Board may wish you to give a classified answer on that.

THE WITNESS: I mean I would like to give an unclassified answer to it and if you think it is wrong, strike it later. I understand that has been done before. I would like to make the statement that this testimony is substantially correct. Livermore is a very new laboratory and I think it is doing a very nice job, but published reports about its importance have been grossly and embarrassingly exaggerated.

DR. EVANS: I have one question.

Dr. Teller, you understand --

THE WITNESS: May I leave that in the record? I would like to.

MR. ROLANDER: Yes.

DR. EVANS: You understand, of course, that we did not seek the job on this Board, do you not?

THE WITNESS: You understand, sir, that I did not

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want to be at this end of the table either.

DR. EVANS: I want to ask you one question.

Do you think the action of a committee like this, no matter what it may be, will be the source of great discussion in the National Academy and among scientific men in general?

THE WITNESS: It already is and it certainly will be.

DR. EVANS: That is all I wanted to say.

MR. ROBB: May I ask one further question.

#### REDIRECT EXAMINATION

BY MR. ROBB:

Q Dr. Teller, you did a great deal of work on the thermonuclear at the old laboratory, too, at Los Alamos.

A Certainly.

MR. SILVERMAN: I have one question.

#### RECROSS EXAMINATION

BY MR. SILVERMAN:

Q I would like you, Dr. Teller, to distinguish between the desirability of this country's or the Government's accepting Dr. Oppenheimer's advice and the danger if there be any in Dr. Oppenheimer's having access to restricted data. As to this latter, as to the danger in Dr. Oppenheimer's having access to restricted data without regard to the wisdom of his advice, do you think there is any danger to the national security in his having access to restricted data?

A In other words, I now am supposed to assume that

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Dr. Oppenheimer will have access to security information?

Q Yes.

A But will refrain from all advice in these matters which is to my mind a very hypothetical question indeed. May I answer such a hypothetical question by saying that the very limited knowledge which I have on these matters and which are based on feelings, emotions and prejudices, I believe there is no danger.

MR. GRAY: Thank you very much, Doctor.

(Witness excused.)

MR. GRAY: We will recess until 9:30 tomorrow.

(Thereupon, the hearing was recessed at 5:50 p.m., to reconvene at 9:30 a.m., Thursday, April 29, 1954.)

END AJG