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# UNITED STATES ATOMIC ENERGY COMMISSION

VOLUME VIII

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J. ROBERT OPPENHEIMER

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I N D E X

<u>Witness</u>	<u>Direct</u>	<u>Cross</u>	<u>Redirect</u>	<u>Recross</u>
SUMNER T. PIKE	1416 1441			
NORMAN FOSTER RAMSEY, JR.	1453	1465		
ISADORE ISAAC RABI	1494	1525	1553 1562	1556 1567

\* \* \* \* \*

P R O C E E D I N G S

MR. GRAY: The proceeding will resume.

MR. PIKE, do you wish to testify under oath? You are not required to do so.

MR. PIKE: I would rather testify under oath.

MR. GRAY: What is your full name, sir?

MR. PIKE: Sumner T. Pike.

MR. GRAY: Sumner T. Pike, 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?

MR. PIKE: I do.

MR. GRAY: Will you be seated, please, sir.

May I, perhaps unnecessarily, call you attention to the existence of the perjury statutes. I am sure you are familiar with them.

I should like to request that if in the course of your testimony it becomes necessary for you to discuss or disclose restricted data you will notify the chairman in advance so we can take necessary steps under those circumstances.

MR. PIKE: I may have to ask Mr. Rolander whether things are restricted or not because I have been away from this thing for two and a half years and I don't know what has been released.

MR. GRAY: Please be free to make any inquiry about

3 it.

MR. ROLANDER: We have Dr. Beckerley with us.

MR. GRAY: The other thing I should like to say to you, sir, is that we treat these proceedings as a confidential matter between the Commission and its officials and Dr. Oppenheimer and his representatives and witnesses. The Commission will initiate no releases with respect to this proceeding. We are expressing the hope that each witness will take the same attitude.

MR. PIKE: It bothers me a little bit in case there should be leaks as to what attitude shall I take, but as far as it seems reasonable and possible, I will go along with your feeling on it. I will be the source of no leaks.

MR. GRAY: I have simply stated the position of this Board.

Mr. Garrison, would you proceed.

Whereupon,

SUMNER T. PIKE

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

DIRECT EXAMINATION

BY MR. GARRISON:

Q Mr. Pike, what is your present position?

A I am Chairman of the Public Utilities Commission in the State of Maine.

4

Q Appointed to that by the Governor?

A Yes.

Q By the Governor and Council?

A Yes. The Council follows very much the same confirmation procedure as the Senate.

Q Are you engaged in business in Maine, also?

A Yes. I am a part owner of a couple of businesses.

Q Sardines?

A Sardines.

Q You served on the Atomic Energy Commission from 1946 to the end of 1951, did you not?

A Exactly to December 15, 1951.

Q You were acting Chairman the last four months?

A No. It was between the time Mr. Lilienthal left which I think was in February, 1950, until Gordon Dean was appointed, I believe, in July of that same year, for a few months.

Q During this period you were well acquainted with Dr. Oppenheimer?

A Yes.

Q Would you say something about the nature and extent of that acquaintanceship?

A I first met Dr. Oppenheimer, I think, at the first meeting of the General Advisory Committee -- I don't remember the date of that -- during that period, which must have

5 been late 1946 or early 1947 until the day I left. It happens to be the day that they were meeting. I also saw him when they met in Washington, which was, I think, oftener than the statutory minimum of four times a year. I sometimes saw him outside of the meetings and I sometimes saw him when he was in Washington not at a meeting of the Committee.

He was in town at times as a member of other boards and committees and sometimes perhaps as just an individual. Outside of the office I saw him -- well, let me see, there was a period I think during the summer of 1947 when we boarded at the Bohemian Grove Forest out in California. We were there three or four days.

Q Us being whom?

A The Commission, its laboratory heads, some of the General Advisory Committee and several scientists like Dr. Wigner. I don't remember whether he was a laboratory head or not at that time. At that period we were put around at the various cottages and Dr. Oppenheimer, Mr. Lilienthal and I were put in the same cottage.

There were other times, once perhaps, or oftener, when the committee was here I had them up to dinner between their meetings.

Q The GAC?

A The GAC, yes. I saw Dr. Oppenheimer, I think, at

6 Dr. Smyth's house. I believe that day I left I was going to see him again but there was a bad snowstorm and nobody could get to Dr. Smyth's. I have not seen him from then until yesterday.

Q The relations between the Atomic Energy Commission and the GAC were of a fairly close character, would you say?

A Yes, I should think so.

Q Did you attend meetings of the GAC?

A Yes. Their custom was to ask us in, usually once or twice during their meetings, and then almost invariably at the end of their meetings, at which time Dr. Oppenheimer would give us an oral review of the things that they had been taking up and the results they arrived at. Later, as I remember it, he would send a written summary.

I don't think there was any meeting they had here that I did not attend in part, except possibly when I was away on vacation or on Commission business.

Q Did you attend a meeting in Princeton in the early summer of 1951 over which Dr. Oppenheimer presided?

A Yes.

Q The purpose of that meeting was to push forward with --

A It was to pull together, as I remember it, various ideas that had developed about hydrogen or fusion weapons. It was quite a substantial meeting. As I remember it lasted

7 the better part of two days.

Q Mr. Pike, there has been a good deal of testimony here about the work of the GAC, and I am going to try to avoid duplicating the record, so I will just ask you a general question.

Based on your observations and of the knowledge of the work of the GAC and of Dr. Oppenheimer's chairmanship of it, did you form any impression as to his own contribution to strengthening the country in the six years that you have been talking about?

A Yes; I think the GAC under his chairmanship made a major contribution to the work of the Commission and the Commission, I take it, was trying to work for the good of the country.

Q You have read the Commission's letter of December 23, 1953, which initiated these proceedings, containing the derogatory information about Dr. Oppenheimer?

A Yes, I read the New York Times which I take it gave the full letter.

Q On the basis of your knowledge of Dr. Oppenheimer and your experiences with him, what is your opinion as to his loyalty?

A I never had any question about his loyalty. I think he is a man of essential integrity. I think he has been a fool several times, but there was nothing in there that

8 shook my feeling. As a matter of fact, it was a pretty good summary, it seemed to me, of the material that was turned over to us early in 1947 by the F.B.I., all except the last thing about the hydrogen bomb. Ofcourse, that was not in then.

Q The letter and, I assume, the file contained data about past associations of his.

A Yes.

Q In your judgment is his character and the associations of the past and his loyalty such that if he were to continue to have access to restricted data, he would not endanger the common defense or security?

A No, I don't think he would endanger the common defense or security the least bit.

Q You read about the Chevalier incident in the Commission's letter and Dr. Oppenheimer's answer?

A Yes.

Q It is not clear as to how much of that story was in the file that you went over in 1947. I assume you went over whatever the file was?

A Yes.

Q Personally?

A Personally.

Q And participated in the discussions with the other Commissioners?

9

A Oh, yes.

Q Do you or do you not have any clear recollection of the Chevalier incident as of that time? If you don't, don't try to --

A I don't think I have much beyond the summary of the letter of last week, which was published last week. There was a lot more there. It was a pretty thick file, but I don't remember exactly what was in the file.

Q May I put to you a hypothetical question which I put to you, I think, last night in order that you might have an opportunity to reflect on it. Supposing that it were established in addition to the description of the incident as it appears in the Commission's letter that after the conversation between Chevalier and Dr. Oppenheimer in which Chevalier had informed him that Eltenton was in a position to transmit secret data to Russia that for several months Dr. Oppenheimer failed to report the matter to the security officers; that thereafter he did on his own initiative report to the security officers, but revealed only the name of Eltenton, and declined when pressed to do so to reveal the name of Chevalier, was not frank in describing the exact circumstances of what had taken place, added to the story about Chevalier without mentioning many certain facts which were not in the picture; that later when again pressed to reveal the name of Chevalier he again declined; that General

10 Groves asked him to reveal the name and he said he would not do so unless ordered; that General Groves said he didn't want to order him to do it, asked him to think it over and met with him again and said he would have to order him unless Dr. Oppenheimer would tell him the name and Dr. Oppenheimer finally revealed the name of Chevalier.

Assuming that this were established would this alter the opinion that you have expressed here to the Board about your present views of Dr. Oppenheimer's loyalty and the propriety of his having continued access to restricted data?

A No.

Q Do you want to say why it wouldn't alter your opinion?

A I think it was a bad incident. Taken alone it would have bothered me very much. I suspect I have been party to incidents in my life that I rather not have certainly taken out of context. This, woven into the context, however, of performance under closer observation for him, many years and achievements of such size as to warrant the gratitude of this country, I don't think it should be given much weight at all.

Q Turning to another topic of the H-bomb for a moment, without going into the details about which there is a great deal in the record, as I understand it in reporting

11 to the President the views of the Atomic Energy Commission about whether to go forward with an all out H-bomb program or not, following the Russian explosion in the fall of 1949, there were several separate reports, were there not?

A There were. I think there were four.

Q Would you just say what they were? I mean who made these four reports?

A Strauss made one definitely for going ahead; Dean made another in which he recommended some prior --

Q He already has testified.

A Smyth and Lilienthal made another.

Q Mr. Lilienthal has testified about that.

A I agreed with them that this was not the time to go on an all out effort but put in a supplementary memorandum which, as I remember, I had to put in somewhat later on account of being on the Coast. I had to take a trip at that time.

Q You went to the Coast after the discussion?

A After the discussion. I don't think I put in my separate memorandum until I got back. That must have been about the middle of November.

Q That was about ten days after the meeting or something like that?

A I think so.

Q That went to the White House?

12

A Yes. Whether it went to the Security Council or the President, I don't know. I have to perhaps say here that I had not realized that I had any access to records so I have not looked at any records since I left the Commission in 1951 and, of course, took none with me. I am relying completely on my memory as to the time and dates.

Q Do you remember the substance of the points that you made in that memorandum?

A I think so.

Q Would you state them?

A One of them was that we had no knowledge that the military needed such a weapon. Another one was that the cost of producing tritium in terms of plutonium that might otherwise be produced looked fantastically high -- 80 to 100 times, probably, gram for gram.

The third one, and this sort of tied into the first, was, as we all know, that the damage power of the bomb does not increase with the size of the explosion, and it seemed that it might possibly be a wasted effort to make a great big one where some smaller ones would get more efficiency.

I think I put in another one: That as between the fission work we were doing and the fusion thing in question here, there were some good things about the fission things. Up to that time and up to the present nobody has

13 brought up anything useful for mankind out of the fusion.

Q Out of the fusion?

A The fusion. In other words, I have never yet heard of any possibility of anything beneficial coming from the hydrogen end of it.

Q In terms of useful energy?

A Other than as a weapon. Again I am going entirely from memory, but I think that is what I put in my memorandum.

Q These were your own independent views?

A They were my own. They could not be completely independent because the Lord knows we had been talking and discussing and, let us say, arguing for well over a month at that time, possibly nearer two months. So the views were the result of a great deal of discussion. I think they were my own. I came with a slightly different set of reasons than the others, although I did come out with the same recommendation as Lillienthal and Smyth did.

MR. GARRISON: I think that is all, Mr. Chairman.

MR. ROBB: I have no questions.

MR. GRAY: I have some questions, Mr. Pike.

I have been in the course of these proceedings pursuing something that has been illusory and evasive as far as I am concerned, and it may be just because I don't comprehend what has been said. This perhaps involves a matter of recollection on your part, so, of course, you can testify

14 only what you recall about it.

In Dr. Oppenheimer's reply, dated March 4, to General Nichols' letter, he referred to the October 29, 1949 meeting of the General Advisory Committee and indicated that this meeting was called to consider two questions. One was the general questions in the light of the news about the Soviet success, was the Commission doing all it should do, and if not, in what way should it alter its course.

The second was to pursue the question of whether there should be a "crash" program with respect to the Super.

The record shows that the then Chairman, Mr. Lilienthal, wrote a letter -- I am sorry I don't remember the date -- to the General Advisory Committee, which raised this first question.

Then the record shows that later in the same month, that is, October, there was a letter -- I can refer to that?

MR. ROLANDER: Yes, certainly. You can show it to him.

MR. GRAY: A letter dated October 21, 1949, signed by you as Acting Chairman of the Commission, to Dr. Oppenheimer with respect to this October meeting and asking certain questions, I believe, that the committee should address itself to.

MR. ROLANDER: (Handing letter to witness)

THE WITNESS: I would not have remembered this in

15 detail, but questions of this sort were certainly running through our minds at the time.

MR. GRAY: Yes. Of course, there are a lot of questions raised in this letter.

THE WITNESS: That is right.

MR. GRAY: I have not looked at it very carefully recently, but I don't believe this second question which I referred to and which appears in Dr. Oppenheimer's reply of March 4 certainly was asked in that form in this letter.

THE WITNESS: Would you repeat that second question for me, Mr. Gray? In reading I forgot what the second point was.

MR. GRAY: Yes. Let me give you the exact language of that.

Dr. Oppenheimer's reply indicates that the Commission asked the General Advisory Committee to consider and advise on two related questions, the second one of which is, and I am now reading from his letter, "whether a 'crash' program for the development of the Super should be a part of any new program?"

What I have been trying to indentify for my own information in that accord is how this second question got asked in that form. I don't believe it is raised in that form by your letter.

THE WITNESS: I don't see it there.

16

MR. GRAY: I might say to you that I believe that Mr. Lilienthal testified that his recollection was not good on this point. Am I correct on that? If I didn't ask him this question it is because it was late and I was tired, because I have really been trying to find out about it.

MR. GARRISON: I think I remember, Mr. Chairman, that he testified he had written the letter that raised the first of these two questions, and I myself don't remember very clearly.

MR. GRAY: My question of you is: Do you recall whether you met with the committee and asked this second question about the "crash" program?

WITNESS: I remember very distinctly the phrases "crash program" and "all out program" being used almost interchangeably for some months. If I had to rely on my unaided memory, and I guess I do, I would think that phrase arose with Mr. Strauss. At least in my mind it ties in with what he wanted to do.

In the meetings of the General Advisory Committee -- of course, I am sure you are aware from previous testimony -- they were not held to the things which the Commission asked them to do. I think there were several times when they got here and either took up things not on the previously prepared agenda of their own motion or something had happened between the time of the calling of the meeting and

17 the time that they got there that would be discussed.

As I remember it, they were reasonably formal and kept pretty full notes, but I don't think there was any reason why a thing should not be discussed and considered even though it had not been put on any agenda, like the calling of a meeting of a Board of Directors or stockholders, you tell them what you know should be discussed and then you leave room for anything new that may come up.

It seems to me that knowing there was a very strong recommendation for a heavy program on what we now call the Super, I guess -- but that is an old name -- this would inevitably have come up in the discussion called for by this letter. I don't know whether I am helping you out or not.

The "crash program" or the "all out program", let us say, was an extreme of one position. It seems to me, let us say, that was the position that Mr. Strauss took.

MR. GRAY: It was the position that the Government of the United States ultimately took.

THE WITNESS: I am saying at this time. The program as laid down by the President in 1950, two or three months later, was, yes, pretty close to a crash program, in that as you may remember -- I don't think this is classified -- it was very shortly embodied in a budget that was set up, an emergency deficiency bill, a very large size, in addition to the one which we had already sent up that year which had

18

already strained the imagination of the Appropriations Committee pretty strongly.

That was a heavy program, yes. I am trying to answer your question. I am afraid I haven't very well.

MR. GRAY: I am afraid You haven't and I won't take any more of your time in pursuing it. I don't think you can answer it. I think you have indicated your memory is not clear as to the letter or instructions.

THE WITNESS: My impression is that this crept into the discussion and probably got the name crash some where along the line because it was a convenient handle, just as the name of Super came along -- I don't know where it came from -- but it became a convenient handle.

MR. GRAY: I would like to turn to something else, if I may, Mr. Pike, and that is the consideration given by the Commission to the Clearance of Dr. Oppenheimer in, I believe, March, 1947.

THE WITNESS: I think that is right.

MR. GRAY: Is it your recollection that the Commission took formal action to clear Dr. Oppenheimer? I might say that there is some confusion about this.

THE WITNESS: I don't have any clear recollection that we took formal action to clear him then. I think you are all aware that was a period of extreme confusion.

MR. GRAY: Yes.

19

THE WITNESS: When the confirmation hearings were going on on the Hill, when the Commission was going through the initial throes of organization and really had not started to organize. My memory is that even the minutes themselves had to be rewritten some months later, that is, the minutes of the meetings. I may be wrong about that. But if you told me that something was not on the record as of that time, I would say I would not be at all surprised.

MR. GRAY: I think the fact is that in August something was written which purported to reflect action taken in March.

MR. ROBB: February.

MR. GARRISON: It said February.

MR. GRAY: It said February when indeed whatever took place actually took place in March. So there is a good deal of confusion. I don't think the record is clear that there was formal action which cleared Dr. Oppenheimer in 1947.

I am just asking you whether you are surprised to hear me say that the record is not clear on that point?

THE WITNESS: No, sir, I am not. I think both Mr. Beckerley and Mr. Rolander were here during that period. This is off the particular subject of Dr. Oppenheimer. But as I remember it, Lyle Bellesly was succeeded by Roy Snapp as Secretary and Bellesly's records were in unsatisfactory

20

shape and unsatisfactory to everybody. I think Snapp went right back and took what he had, what he could find, and wrote up things. There were a lot of ex post facto things in the record.

I think you will find if you go through it there were a lot of things picked up and a lot of things missed that should have been picked up.

MR. GRAY: The fact is that the Chairman of the Commission discussed this matter with people in the White House at about the time that the Commission read these files.

THE WITNESS: I am quite sure about that.

MR. GRAY: Is it possible that this kind of thing could have happened: That the Commission knew that the Chairman had consulted the White House; that the Chairman was perhaps expecting some further word from the White House; that no further word ever came from the White House and that in fact nothing was ever done about the action on the clearance?

THE WITNESS: I suppose that is possible. Of course, that "as of" date was before the delivery of this dossier; the February date, if I am not mistaken.

MR. GRAY: Yes; the February date could not, I think, be correct.

THE WITNESS: I am not sure that it couldn't.

MR. GRAY: You mean it is possible that the clearance

21 might actually have been considered in February?

THE WITNESS: I am not sure. For instance, the clearance of all the members of the General Advisory Committee might have been made and considered in February. I am not sure that it might not have happened that this was the only case where a question was raised. This may have been kept in abeyance to see whether that should have been confirmed until August.

I am no clearer on the thing than our records are, but I think that is all in the realm of possibility.

MR. GRAY: Did you consider, however, this a serious thing at the time?

THE WITNESS: Oh, yes, I did. I am sure we all did. There were five of us on the Commission. As I remember it, this was a unanimous action.

MR. GRAY: I am going to change my course now a little bit, Mr. Pike.

You testified that one of your reasons for not being enthusiastic about the all out program was the fact that there had been expressed no military need for this kind of weapon.

THE WITNESS: Yes.

MR. GRAY: Do you think it possible that a military need had not been expressed to the Commission at that time because the military did not have any reason to believe that

22 it was feasible? The reason I ask that is that once it became feasible there seems to be no question that the military people think there is a need. I believe that is correct.

THE WITNESS: I think you will find, or there should be in the documentation of the Commission and probably in that of the military liaison committee, the first expression of the military that such a thing was desirable. I don't remember the date of it, of course. I remember distinctly seeing such a paper. Whether it was in a meeting of the military liaison committee meeting or a Commission meeting, I don't remember.

I will say this: That we were accustomed to seeing foul ups over in the military to the point where they could not agree with what they wanted. We were accustomed of knowing all the disagreements between the services.

I remember on this hydrogen bomb thing telling Secretary Johnson that we were getting very impatient with their waiting so long to come to decisions; that we could expect to have things done, and we expected to be doing them while they were messing around with their papers over at the Pentagon. But he seemed a little miffed, although he was well aware when things went up to the Joint Chiefs they went round and round and round until somebody gave them a jolt.

I remember frankly in the back of my head thinking that I would like to get these boys on the line. I think

23 later they came on the line. You are perfectly familiar with that. You were in that rat race at one time.

MR. GRAY: My recollection is about the same as yours.

I suppose people in the military liaison committee at that time perhaps can answer the question I put to you better than you could.

I want to ask you one other serious question. You say that as of 1949 and indeed as of today so far as you know, there seems to be no use other than a military which might come out of these processes?

THE WITNESS: Yes, sir, I believe that is correct.

MR. GRAY: I am asking for information. I don't believe we had any testimony on that.

THE WITNESS: I am sure that there had been none suggested then. If there have been any suggested since, I am unaware of it.

MR. GRAY: In your official position you would be very much interested in that.

THE WITNESS: I would. All I am saying is that a good many things have happened since December 15, 1951 and, of course, I would not be aware of those. I have had no security clearance. I think I have been in the Commission Office once at their request and that was when the question came up of power plant for the Paducah operation.

24

MR. GRAY: Are there any questions, Dr. Evans?

DR. EVANS: Yes. Mr. Pike, I understand that you did say that Dr. Oppenheimer made a number of mistakes?

THE WITNESS: I think so, yes.

DR. EVANS: I want to ask you another question. If you had been in Dr. Oppenheimer's position when he was approached in this matter about giving information to our enemies, you would have reported that immediately, would you not?

THE WITNESS: In 1943 I think I would have. I fortunately was not in the position of having that question put up to me. But I think I would have.

DR. EVANS: I wish you would explain. Do you think there is any military need today for a Super?

THE WITNESS: Yes, I believe there is, Doctor. I think if you go back and get the document I think exists, you will see one or two reasons that I didn't have in mind.

One of them, for instance, is that you get a much larger margin of error for a miss. Something, for example, that will take a radius of ten miles rather than one mile.

Another one is that if you can get through you only put at risk one or two or three planes as against a flock of them to destroy a big target.

I can rationalize uses for the Super. I felt that the military desirability of the Super ought to be estimated

25

by military people rather than a bunch of civilians like ourselves. I still think their views would be quite authoritative with me.

DR. EVANS: You wished in your own account here to go rather slow on this Super, didn't you?

THE WITNESS: I wished to get, as I testified later before the Joint Committee, to get more facts before going out on a crash program. This was a thing involving, as I remember it, at least a couple of billion dollars.

I would like to bring in here one thing that was not very well considered in the period we were talking about but had to come up some months later. I think it was after Mr. Lillienthal left. I remember I was on that committee of the National Security Council.

The order had been given and the question was not whether to go ahead but how to go ahead. I brought up at that meeting my point of view which was that this country could be in no more miserable position than to have a successful development on our hands and then to have to spend three or four years in building factories to produce the thing.

Therefore, in going ahead with the development we had to at the same time go ahead with our factories or plants just as though we were sure we were going to have a successful development. That seemed to me always to be an inherent part of the development question.

26

You see why we would be in a miserable position. We had proven that it could be done, and somebody else could have easily proven the same thing at the same time and three or four years to build plants would be a pretty tough period.

So it involved a major expenditure of time and money, effort and manpower and it was not a thing to be gone into lightly. I wanted to get some important facts into the picture, all the facts that could be gotten, and I was not willing to recommend a drive program until we had some of those facts.

Some of them came in if I am not mistaken. I think we got that military appraisal or at least a military appraisal before the January, 1950 decision from the White House. I am not completely sure of that, but I think that was in.

I don't know whether I have answered your question or not.

DR. EVANS: Yes, I think you have. The thing that I was trying to get your opinion on was as to whether A-bombs as big as this and as costly as this would mean that we ought to have a lot of targets on which to use them, whereas if we only had a couple it would be like killing a mosquito with a sledge hammer.

THE WITNESS: This was in my mind. I am afraid to give numbers would be to get into a security point. The first military appraisal I saw indicated that there were not

27

very many targets on which they thought such a big bomb would be required. There were some.

DR. EVANS: Thank you.

MR. GRAY: I have just one question suggested by Dr. Evans' question.

You view was that we ought to know more about it. You were not just unalterably opposed?

THE WITNESS: No. I think I put in in my memorandum which you should have the qualification "at this time".

MR. GRAY: Is it your recollection that most of the members of the General Advisory Committee were opposed at any time?

THE WITNESS: No, that is not my recollection, although I would, of course, have to refresh my memory. That is not my recollection. I think they brought in, as perhaps they properly should, some, let us say, political and strategic and moral questions which frankly did not weigh very big with me. As far as I am concerned there was not then and there is not now a great deal of difference in morality between one kind of warfare and another. This stuff never affected me very much. But I think the GAC did give it perhaps more consideration than I did.

MR. GRAY: Do you have any questions?

MR. GARRISON: Just a few, Mr. Chairman.

## FURTHER DIRECT EXAMINATION

BY MR. GARRISON:

Q Speaking of what was before the GAC at their meeting on October 29, 1949, in response to a question by the Chairman you said something to the effect that the question of the crash program crept into the discussion, as I recall the phrase.

I wonder if when you were talking about discussion you had reference to the preliminary meeting between the members of the Commission and the members of the GAC which started off the meeting, as I understand it, in accordance with the regular practice?

A No. I think what I was referring to was the various meetings of the Commission during, let us say, the month or a little more than a month between the announcement of the Russian bang and this GAC meeting.

Q In other words, in the Commission's discussions before the GAC meeting the question of a crash program for the H-bomb was to the fore?

A I think so. Let me bring another group in on that. Don't forget that we had a large and a very able staff. We had the heads of the various divisions in Washington and we had at our various outposts people who came in on short notice. I am sure the Commission minutes will show who was at various meetings and when, but I am completely clear in my memory that there had been a lot of discussions. I am not

29 completely clear in my memory exactly when they took place and who was present at each one. That is a matter of record and can be very clearly and easily got at.

Q When the question was put to the GAC in Mr. Lilienthal's letter asking that consideration be given to whether in view of the Soviet success the Commission's program was adequate and if not, in what way it should be altered or increased, would it or would it not have been a natural outgrowth of that question, considering the times and the discussions that you had, to consider the question of the hydrogen crash program?

A I think it would have been a natural thing. If you will remember, the hydrogen question had never been dropped. It had been in charge of a small group headed by Ed Teller. Dr. Teller was never one to keep his candles hidden under bushels. He was kind of a missionary. I might say that perhaps John, the Baptist is a little over-exaggeration. He always felt that this program had not had enough consideration. Teller in my view was a pretty singleminded and devoted person. I would guess that it would have suited him completely if we had taken all the resources we had and devoted it to fusion bombs.

He is a very useful and a very fine man, but I always thought he was kind of lopsided, as a good man specialists are. This was one of the things that would naturally

30 have come into any involved discussion of what we ought to be doing. I don't know whether I have answer your question or not.

Q Just two more question.

After President Truman gave the go ahead on the H-bomb program, did the GAC, as you recall, cooperate with the Government and accept that decision and move forward?

A Yes. When you say move forward, one has to remember that some of the developments in the early months were quite disappointing. The thing was attacked, I think, wholeheartedly and we were not happy, not about cooperation, but not happy about the results for some time.

Q Did Dr. Oppenheimer, so far as you yourself knew, do anything to delay or obstruct the program?

A Oh, no, rather the reverse.

Q One final question.

When the Chairman was talking with you about the question of the 1947 clearance, you used the phrase "unanimous action." I would like to ask you, leaving aside the question of dates and minutes, what you recollect of what the commissioners actually did do. Did they sit around the table together and consider the matter of Dr. Oppenheimer's clearance and come to some view about it, or how was it done?

A They did what you suggest. I want to go back to a fundamental question of Commission organization which came

31 up very early when we met. I had something to do with the result of it. There was a question as to whether we should not organize, let us say, something like the Interstate Commerce Commission -- so and so be in charge of this, and so and so be in charge of that, and sort of departmentalize ourselves. That question was answered in the negative and I was instrumental -- I do not say I was the dominant factor, but I had this experience on the Securities and Exchange Commission just after they had abandoned that sort of division or labor system and the very unsatisfactory results of that were in front of my mind -- so that while naturally each one perhaps would give a little more attention to the thing he knew best -- Bacher, let us say, was the physicist, I knew something about mining and raw materials, and so on. Yet, our actions were taken together and our responsibility was both joint and separate and complete. In other words, while we asked for advice and asked for help in a great many areas, the final responsibility was always ours, and it was always joint and if anybody had a dissent, it was recorded in those meetings. So, if there was no dissent recorded, each one of us was in on the decision and each agreed on it.

Do I answer your question?

MR. GARRISON: That is all, Mr. Chairman.

MR. GRAY: Was any member of the Commission interested

32 particularly in security problems? You were interested in mining, for example. Do you remember whether any Commission or at that time was?

THE WITNESS: I would say that Commissioner Strauss had some background in security problems when he was over at the Navy and perhaps took a more direct interest than the rest of us. This security problem, I may say, was the most nagging problem of all in a good many months of the Commission's existence.

If you remember the law, it not only required an FBI investigation of new employees but also required going over everybody who had been cleared by the Manhattan Project who was still working. This dragnet brought up quite a few customers I probably am exaggerating but it seemed to me as though we took over half our time for the first seven or eight months on these distinct personnel security problems.

Of course, there were physical security problems, such as a barb wire fence had rusted, or the grass had grown so that a fellow could slither through it near one of the plants. This could not all be corrected at once. This was part of the general neglect into which the project had fallen during the year or so Congress had been trying to make up its mind as to what law to pass and the further three months Mr. Truman was trying to draft five people willing to serve on this Commission. The war was over, let

33

us say, in August 1945, the Commission was appointed in late October -- I would guess the 28th -- of 1946, and there was a period of slow down which looked at that time when we came on as though it might culminate disastrously. There were a lot of problems that had come up.

Let me give you an example on the security thing in looking back. I think it was in March, 1946, as it turned out later, there was a series of petty thefts out of Los Alamos of photographs, of models of bomb cores, of documents and it looked as if at that time morale must have sunk to an incredible low, particularly in the Armed Services. This is when they were trying to demobilize. Operation Magic Carpet had just been over. There was a terrible period for both physical and personnel security and morale that my gess would be got to its worse in late March, 1946, and then it seemed to be better or these crazy idiots were out of the program.

MR. GRAY: Mr. Lillienthal testified that the Deputy General Counsel of the Commission, Mr. Volpe, was active with him in considering Dr. Oppenheimer's clearance.

Do you recall whether counsel of the Commission participated in this, Mr. Pike?

THE WITNESS: No, I don't.

MR. GRAY: Would he have normally sat with the Commission when they considered these security cases?

34

THE WITNESS: No. The counsel of the Commission like every other officer of the Commission was called in when the Commission felt it needed him. Of course, Volpe was a natural for this thing because he had done some security work for General Groves before and had a general acquaintance I think with the security problems in the Manhattan District.

During this period, as I say, we had no security officer, or if we had one, I don't remember who it was. You picked on the fellow who might be of some help and Joe Volpe had some background in this sort of business.

MR. GRAY: It was not because he was assistant counsel or deputy counsel, but more because he had a background.

THE WITNESS: That would be my belief, yes, sir.

DR. EVANS: Mr. Pike, you spoke about the trouble you had with investigating the security. Did it seem to you that there was really more screwy people in here than you would have expected to find ordinarily?

THE WITNESS: No, I don't think so, Doctor. As I remember it, a great many of the star customers had already gone. My best recollection is that of about 60,000 people on the job at that time, we had around 60 or 65 -- it sticks in my memory as one tenth of one percent -- of people about whom there were questions coming from a vague doubt to a fairly substantial doubt. Those figures may not be exact

35 but that is the range, I am sure.

DR. EVANS: Thank you; that is all.

MR. GRAY: Thank you very much, Mr. Pike.

THE WITNESS: Thank you, sir.

(Witness excused)

(Discussion off the record)

MR. GRAY: Let us get back on the record.

MR. ROLANDER: As I said, Mr. Chairman, we have not had an opportunity to review all of the transcripts of what we had hoped to be unclassified portions of the hearing, so we have permitted Dr. Oppenheimer and his counsel to review the transcripts here in the AEC building. As we complete our review we turn the transcripts over to them by receipt. I have also permitted them to use secretaries for the purpose, as I understood, to assist them in preparing questions and what material they needed to continue their presentation. I am somewhat concerned, however, that if they bring stenographers in here that they not make copies of the transcripts until they have been approved from a classification standpoint.

I wanted to go on record as noting that some information may have to be classified from a national defense standpoint. This information should be protected from that standpoint as well as the confidential relationship between Dr. Oppenheimer and the Commission.

36

MR. GARRISON: Mr. Chairman, Mr. Ecker and Mr. Topkis from my office have been at my request making summaries of various portions of the transcript and have the transcript as a whole in the room assigned to us and with a stenographer at intervals to whom they have been dictating. Up to this point I had assumed that there was no problem about this at all.

I suppose in the nature of things there are bound to be where something in the record needs to be cleared up a quotation here and there directly from the transcript dictated to the stenographer to write up so that we can study it. It is awfully hard for us to work here ourselves in that room.

Now, if there is a security question about the contents or about quotations from the transcript, I would like to know what it is so we could have an understanding about it.

Do I understand that these transcripts that we have been working on are still in some way being reviewed?

MR. ROLANDER: Yes, they are. They are being reviewed not only by our own classification officer, but by representatives of other agencies.

DR. BERKELEY: May I make a comment for the record.

We have made arrangements with the Department of Defense for review of certain portions of the transcript. Two or three people are coming over at one o'clock today. I hope we will be able to clean up all of the Defense Department

37

questions with respect to the transcripts to date at that time.

There is some intelligence data that has crypt in in a few spots. I have taken steps to have that reviewed. In addition there is some material which may have sensitivity in the Department of State. This is also being reviewed at the present time.

MR. GARRISON: Have you any suggestion to offer about it?

DR. BERKELEY: I would be happy to define the areas which I am quite sure there are some questions about. Whether there is any classified information in these particular sections, I don't know.

MR. GARRISON: Could you mark the portions of the transcript that are being reviewed for security purposes and then have it understood that we would not make any quotations from those portions of the transcript?

DR. BERKELEY: I certainly could, yes. I can identify the areas where there is some possible sensitivity but in view of the fact that these are matters outside of the purview of the Commission I have no way of knowing whether these are or are not sensitive.

MR. GARRISON: Could that be done with some expedition?

DR. BERKELEY: Yes, I could do that right now, as

a matter of fact from my notes.

MR. GARRISON: So that at lunch, let us say, we would know what those passages or portions are?

DR. BERKELEY: Yes. Could you indicate which parts of the transcript or are you doing them in sequence?

MR. GARRISON: We are doing them in sequence. I asked Mr. Topkis to begin at the beginning, page one, and give us a summary.

MR. ROLANDER: Mr Garrison has received volumes one and three. So it would only pertain to volumes two, four five, six and seven.

DR. BERKELEY: Two is one of our more troublesome ones since it concerned the witness' activities with the Defense Department.

MR. GARRISON: One and three are completely clear and can be taken out of the building.

MR. ROBB: Those you have, Mr. Garrison?

MR. GARRISON: Yes.

MR. GRAY: Let me suggest that I believe we are discussing matters which really should be between counsel and the Atomic Energy Commission and its officials on which I think this Board can't make any ruling. I don't mind hearing the discussion, but I think we are taking the time of the Board to cover material with which you ought to deal with Mr. Rolander.

39

MR. GARRISON: Yes. There are volumes five and six of the transcript. When will we get those?

DR. BERKELEY: Five has some material which I have asked State to look at. I can define the areas.

MR. GARRISON: We had them to work on last night but not this morning.

MR. GRAY: If this conversation is going to be pursued I am going to have the Board excused and let Mr. Rolander and Mr. Garrison discuss it.

MR. GARRISON: It is relevant to the Board because it is a part of the whole procedural problem we do face, which we have to bring to the Board's attention, Mr. Chairman.

MR. GRAY: Anything that is under the jurisdiction of this Board should be brought to the Board's attention, but I cannot make a ruling on security matters.

MR. GARRISON: Mr. Chairman, just one statement for the record. If there is anything -- we will make our copies available to you of everything that we have dictated or written up to this point -- that we have extracted from the minutes that has a security question, we want to make it perfectly clear that we will return that to you.

MR. ROLANDER: Fine.

MR. GARRISON: That, then, can be worked out.

MR. GRAY: We will take a short recess.

(Whereupon, a short recess was taken)

BOWFLSP

MR. GRAY: Would you stand and raise your right hand, please?

MR. RAMSEY: Yes, sir.

MR. GRAY: Do you wish to testify under oath?

MR. RAMSEY: Yes, sir.

MR. GRAY: You are not required to do so, but all of the witnesses have.

MR. RAMSEY: I am perfectly willing.

MR. GRAY: Norman Foster Ramsey, Jr., 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?

MR. RAMSEY: I do.

Whereupon,

NORMAN FOSTER RAMSEY, JR.

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

MR. GRAY: Will you be seated, please, sir.

It is my duty to call your attention to the existence of the perjury statutes. I assume you are familiar with them.

THE WITNESS: Yes, sir.

MR. GRAY: In the event, Professor Ramsey, it becomes necessary for you to refer to restricted data in your testimony, I would ask you to let me know in advance, so

that we may take certain appropriate and necessary steps.

I should also observe to you that we consider this proceeding a confidential matter between Atomic Energy Commission representatives and Dr. Oppenheimer, his witnesses and representatives, and the Commission will make no public releases. It is our custom to express the hope to the witnesses that they will take the same view.

THE WITNESS: I might add one thing sir, that the Chairman of my department called in great concern that a newspaper reporter called him yesterday and asked him if by chance I were to be a witness, and he said he wasn't sure, or something like this, and this got reported in the paper that Professor Bainbridge said I was to be a witness here. This is certainly not my fault and certainly not his.

MR. GRAY: Yes.

#### DIRECT EXAMINATION

BY MR. GARRISON:

Q You are a professor of physics at Harvard University?

A Yes, sir.

Q You come from a military background?

A Through my father. My father enlisted at the age of 16 in the Spanish American War. He then went to West Point. He served in World War I and World War II, and is now retired a brigadier general.

Q What were your wartime positions? Would you just

run over those briefly?

A I was consultant to the National Defense Research Committee. I was doing radar research at the Massachusetts Institute of Technology, at MIT Radiation lab. I was an expert consultant to the Secretary of War in the Pentagon Building with the Air Force during about 1942-43, and I was at Los Alamos from 1943 to the end of the war, during which time I actually was officially employed as an expert consultant to the Secretary of War, though I worked completely within the Los Alamos location.

Q What positions in the government do you now hold?

A No full time position. I am a consultant to a number of the services, that is, I am a member of the Air Force Scientific Advisory Board. I am a member of the newly established Defense Department Panel on Atomic Energy.

Q Excuse me. Is that panel in substance the successor to the atomic energy responsibilities of the Research and Development Board?

A Not in a certain sense a strict successor, but with the reorganization this is what has been substituted for it. I am actually also supposed to be today, and yesterday as well, attending a meeting of the Knothole Committee of the United States Army on Combat Preparedness and various other more minor things.

Q When did you first meet Dr. Oppenheimer?

A I first met Dr. Oppenheimer in the summer of 1940.

Q This was at a meeting of the American Physical Society?

A That is correct, the Seattle meeting of the American Physical Society, which was also on my honeymoon and Professor Zacharias, who had a car, we had been riding with him, and Dr. Oppenheimer rode with us from Seattle to Berkeley, and we stayed at Dr. Oppenheimer's house for approximately two days in the early summer of 1940.

Q This was at the time of the collapse of France in World War II?

A Yes, sir.

Q Did you have any conversations with Dr. Oppenheimer about that?

A We had a number of conversations, and it is certainly difficult to reconstruct all of them in any detail.

Q I wouldn't ask you to.

A On the other hand, I do remember some. In particular there were some on that at which Dr. Oppenheimer expressed a very grave concern for the French and the British and particularly a rather fondness for Paris, and the trouble which it was very actively in at that time, though this was at the time of the Russian-Nazi Pact.

Q At Los Alamos, when you were there from 1943 to 1945, what was your particular job?

A I was head of the so-called delivery group, which meant that this was the group that was concerned with making sure that the Los Alamos weapon was a real weapon, that is, something that could be carried in an airplane and dropped from same.

Also, this meant I had charge of the relationship with the Army Air Forces, and the 509th Bombardment Group, both in the testing of same and then ultimately actually I was chief scientist at Tinian, where we assembled the two atomic bombs used during the war. Actually the late Admiral Parsons was head of the group at Tinian, and I was chief scientist under Admiral Parsons.

Q To what extent was there compartmentalization at Los Alamos and what would your observation be as to the general policy which was adopted there about the division of labor among the groups?

A I would say for the basic scientific developments, there was very little compartmentalization for very good reasons. This was also true at the MIT Radiation Lab. It had been discovered quite early in the war in a number of laboratories that inefficiency went up very rapidly with excessive compartmentalization. Actually at Los Alamos my own group, being somewhat more over the direct scientific developments and also being considered one of the most top secret things -- particularly the fact that we were so far

along that anyone had any interest in relationships with the Air Force -- for this reason we were to a considerable degree compartmentalized. That is, we were never invited to give reports at the staff seminars on what we were doing.

Likewise, when we were away from the place, we were in fact required by security regulations to some degree to our embarrassment to be untruthful as saying where we came from. We were not allowed to say we came from Los Alamos. In fact, we had to say we came from other places.

Q Would you care to make any comment upon the quality of Dr. Oppenheimer's leadership at Los Alamos? I don't want a great deal of detail, but just your impression.

A Yes, sir. I saw it very obviously through the work and was most impressed in every way. I think he did a superb technical job, and one which also made all of us acquire the greatest of respect and admiration for his abilities and in view of this hearing I might also add his loyalty and his integrity.

Q At the end of the war was there a problem of holding Los Alamos together?

A Yes, a very great problem in that most of the key people in the laboratory, like myself, were men fundamentally interested in pure science. For patriotic motives we had by then been devoting four or five years of our lives since we had really started in 1940 before the work working on

things. We were indeed very eager to get back to our research laboratories where we would do the fundamental research that we were here to do.

As a result everyone was very eager to get away. It was chiefly some rather eloquent pleas on the part of Dr. Oppenheimer that kept many there together. Actually I know of this in two ways. One, by the fact that for the initial pleas in this direction I was not at Los Alamos since I was in charge of the group at Tinian. Most of us there thought all of our friends would be rushing away from Los Alamos with terrific rapidity. We arranged by cable gram for moving vans, asked our wives to arrange the moving. As a matter of fact, when we got back, we were in some degree of disgrace with the rest of our friends who had the benefit of Oppenheimer's lecture of the importance of staying on.

I was actually one of the first people getting away from Los Alamos, and I have been somewhat embarrassed about this ever since. I was also told off about this.

Q During the controversy about whether to go ahead full steam on the H bomb program or not, that is to say, roughly in the fall of 1949, and continuing on until President Truman's announcement in January of 1950, you were a member of the Air Force Science Advisory Board?

A That is correct.

Q You did not take any official part in the formulation

of policy about the H bomb?

A No, sir.

Q I just want to ask you one question --

A We were, however, informed to a considerable degree of the technical status of it. That is, we were given review meetings at Sandia.

Q I want to ask you one question as a matter of interest. How did your own mind at that time run on the question?

A I found it a very difficult problem that I worried about a great deal, even though I did not contribute to it. I would say roughly I was in the state of schizophrenia, which was best described by saying I was actually 55 per cent in favor of going ahead, that is, I felt it was a development even with a crash program was appropriate to, and 45 per cent in my own mind against it. Again this I also record as 100 per cent loyalty. It was not a matter of loyalty versus disloyalty, certainly from what I had been presented; it was not a very useful looking weapon that was being described with the probability that it would take a most fantastic airplane to carry it. I better not go much further.

Q During the past four or five years, Dr. Oppenheimer, I think, has been Chairman of the Committee of the Harvard Overseers to visit the Harvard physics department?

A Yes, sir.

Q Have you had some association with him in that

connection?

A Yes, I have had quite a few, chiefly on two different problems. The first one was immediately following the outbreak of hostilities in Korea. Our department was very much concerned and worried with what was the best way for our department to contribute to the country when the country was in a state of emergency, at the same time doing its very important work also for the country of training students. We had a number of discussions among ourselves, and a particularly enlightening discussion with our visiting committee under the chairmanship of Dr. Oppenheimer -- the visiting committee includes chiefly the various industrial physicists -- and I think the help we got from them was very great.

During these conversations, Dr. Oppenheimer particularly eloquently expressed the problem that the United States was faced with, the threat that was there from Russia and emphasized the importance of our doing work, particularly by taking leave from Harvard for consultation and also urged with the president and provost, at least I am told of it later, the importance of allowing members of our staff to take such leave. Indeed, they have been taking it.

I think on the whole we have averaged one or two men, usually about two men, at any one time from our department on leave on one or another defense project. Some, for example, on the H bomb. There is one at Livermore at the

present time.

Q Did you have any discussions with Dr. Oppenheimer in his capacity as Chairman of the Visiting Committee about the question of Professor Wendell Furry?

A Yes, sir. We had numerous discussions. For background I should add that our department had the misfortune of having one of the more famous of the cases in one of the Congressional investigations, namely, a member of the physics department at Harvard, Professor Wendell Furry, in some early hearings of the Congressional committees, using the Fifth Amendment. He is no longer using the Fifth Amendment. He did in the early hearings. His first use was without consultation with anyone. In fact, his lawyer said don't discuss this case with anyone. They don't have immunity privileges. He is on his own, I am afraid, on this kind of a matter, not too bright a fellow. He thought he should use the Fifth Amendment which I personally greatly regret.

After this was done we had extensive conversations with several members of our Visiting Committee, particularly Oppenheimer as Chairman. Oppenheimer very vigorously deplored to both some of us in the department and also to Furry himself the unwisdom of Furry's choice, and even the wrongness of Furry's choice in using the Fifth Amendment.

He also during the course of this expressed rather strong feelings about the fact that Furry had been for

really a fantastically long time a member of the Communist Party.

I must admit that during these discussions which were quite extensive, the kind in which we each shared views, to the best of my knowledge Oppenheimer's views and my views, completely independently arrived at, we each had those views at the time we first got together, were essentially identical.

DR. EVANS: Did you suspect Furry of being a Communist before that time?

THE WITNESS: I actually did not know Furry during the period he was a Communist. He was out of the Communist Party when I first met him. I certainly was not too surprised he was. Even in the first two years I knew him -- he has changed quite markedly -- even those views were a little bit wild in my opinion. I did not know and neither did other members of the Department know that he had actually been a member of the Communist Party.

BY MR. GARRISON:

Q I think he had been a graduate student at Berkeley?

A He had, but I believe I am correct in saying he had not been a member of the Communist Party at that time. I believe he joined only after he came to Harvard.

Q You were a consultant on Project Lincoln?

A Yes, sir.

Q Did you have occasion in that capacity --

A There were several meetings. Actually I was a consultant in a sense that did not work very hard on the project. I was chiefly called in on various policy discussions. This is an air defense continental defense laboratory of all the services, but particularly the Air Force, under contract to the Massachusetts Institute of Technology. I was consultant of this and chiefly sat in on various meetings at intervals discussing policy.

Dr. Oppenheimer had been on the summer study group there which group I was not a member of but which came out with I think some very important suggestions for the defense of the United States, most of which I gather in one form or another at least are now being adopted by the armed services.

In these policy discussions we certainly discussed these to a fair extent. Throughout these again I had reaffirmed what I had known all along, the deep feeling of loyalty and of concern which Dr. Oppenheimer felt for the United States and very clearly that the thing of which he was afraid, the country of which he was afraid, was Russia.

It was just as much as in the Pentagon Building. It was a case a Russian bomber can take off from here and get through. It was not any sort of saying, "Well, now, we better not consider the Russians to be our potential enemy."

MR. GARRISON: That is all.

## CROSS EXAMINATION

BY MR. ROBB:

Q Doctor, when did you first learn that you were going to be a witness here?

A I first learned that I was to be a witness, I would say -- it is hard to say -- roughly three weeks ago. I had heard of the charges -- not of the charges -- I had heard that Dr. Oppenheimer's clearance had been suspended prior to that time. I heard about that officially through the Air Forces in conjunction with my work in the Scientific Advisory Board.

Q How did you learn you were going to be a witness?

A I learned by phone call from Mr. Garrison asking for an appointment, which I admit I had no idea and we had the appointment. I can look up the exact date in my calendar if it is important.

Q It is not important. Did you discuss the matter of testifying with your superiors?

A No, sir. Universities operate in funny ways. I don't think we have particular superiors in this kind of matter.

Q Did you tell anybody in the department?

A I only told the charman of my department as I was leaving to come here.

Q Who is that?

A Professor Kenneth Bainbridge, who incidentally was the scientist in charge of the first atom bomb tests in New

Mexico.

Q You mentioned Dr. Furry, is it?

A Yes, that is right.

Q He was at Harvard for some time?

A I think he came to Harvard -- the two dates I will get mixed -- I would say he came to Harvard in 1936, and joined the Communist Party in 1938. No, he would not have joined in 1940. He came in about 1936.

Q When did you know him?

A I may have met him, it is one of these things you can't be sure when you meet a person, I met him during the war at a Physical Society meeting but my first knowledge of meeting him to attach a name to him and know the man was when I arrived at Harvard in the fall of 1947.

Q And you knew him from then as an associate?

A I knew him as an associate and very well.

Q As a colleague?

A A colleague, that is right.

Q Did you suspect that he either was or had been a Communist?

A If there had been any member of our department who would have been, he would have certainly been the one. I must admit that it seemed to me somewhat in some of our political arguments in my opinion he is not terribly sound on them. I would like to get in the record I am a very strong opponent of

the Communists and have been.

Q I gathered that.

A On the other hand, Furry is being confronted with a real tough problem. He has completely changed. Of this I know. He is also now an opponent of the Communists.

Q I see in Dr. Oppenheimer's list of publications on his PSQ a lot of publications.

MR. GRAY: Perhaps you better identify for the record what a PSQ is.

MR. ROBB: Personnel security questionnaire. There are a lot of articles and things.

BY MR. ROBB:

Q I see one here on the Theory of Electron and Positive, W. W. Furry, Phys. Rev. 45, 245-262, February 15, 1934. Also Phys. 45, 34-43, 34-44, March 1, 1934. Would that W. Furry be Wendell?

A This is the same Furry. I should add one thing on the basis of sworn testimony on several committees from Furry, he was not a member of the Communist Party at that time, and was not a member until four years subsequent to that time. He joined in 1938. This is in the testimony of the McCarthy hearing in Boston.

It is also in Furry's testimony to the Harvard Corporation which was investigating his case.

Q Do you recall whether he said where he was when he

joined the Party?

A He said he was at Harvard. I know which came first, but I don't know the time sequence. I am sure it was in 1938 he joined actually.

DR. EVANS: Did you have a Communist cell at Harvard?

THE WITNESS: According to the testimony of practically everyone who was in it there was a group of, I guess, about ten or so people in the period of around 1938, chiefly, who were indeed members of the Communist Party. There has been quite a lot of testimony about that group, sir, and by people all of whom were away out of the Communist Party at the present time, and it indeed emphasizes the point there are all sorts of ways of being Communist. This was a high and idealistic group of people, completely foolish in my opinion, naive and stupid, to have gotten into it, but nevertheless, they were a very high minded group which by the sworn testimony of all concerned, if anyone had ever approached them and asked them to do anything even remotely treasonable, they would not only have refused to do it, but they would have after a certain degree of soul search, would have felt obligated to report it at that time. There are just many ways of being foolish.

BY MR. ROBB:

Q You were at Los Alamos from 1943 to 1945?

A Yes, sir.

Q Was that a pretty closely knit group down there?

A Yes, sir.

Q I suppose among the physicists --

A A very fine group, too, I should say.

Q And among the physicists everybody knew everybody else pretty well?

A Fairly well, although as the lab got bigger, there were a number whom you certainly did not know. I will name one offhand I did not know although you subsequently get the impression that this is the most important scientist we had, and this is Fuchs. To the best of my knowledge he was never at the lab. I had never seen him.

Q Did you know a man by the name of Philip Morrison?

A Yes, I did.

Q How well did you know him?

A I would say only moderately. He was not in my group. On the other hand, he worked quite closely with us at times. Incidentally, to the best of my knowledge, he did a very good job there. Incidentally, he is at the present moment a professor at Cornell University.

Q Did you see any indication of Communist leanings on his part?

A Yes, I would say not necessarily at that time. There were many subjects which we would argue and I would disagree.

But they were friendly disagreements. He thought I was a little naive and I thought he was a little naive.

Q When did you discern indications of Communist tendencies on his part?

A I don't know. I think I probably always considered him leftish and I certainly never knew he was more than that. I might add by reputation even before I met Dr. Oppenheimer, he had the reputation of being leftish. I certainly never heard anyone say he had been a member of the Communist Party. I think the same is true of Morrison.

Q Did you know Charlotte Serber at Los Alamos?

A Yes, I know her.

Q What can you tell us about her Communist tendencies or otherwise?

A I must admit on that I did not know that she had them. There is a certain mannerism. Sometimes she had a characteristic of, oh, maybe a little intellectual snobbery at intervals, which I think some people have had, which incidentally she has gotten completely over subsequently. I think there is nothing in the political discussions that would have implied it. Actually I got to know her better since the war than I did at Los Alamos so we lived more closely together then. I have seen her as recently as a month ago.

Q Where are they now?

A Professor Serber is a professor of theoretical

physics at Columbia University. He is also a consultant at the Brookhaven Laboratory for the Atomic Energy and presumably thereby cleared.

Q What about David and Francis Hawkins, did you know them at Los Alamos?

A I knew them. Again they were not among my intimate friends, but we knew them. They seemed to be doing a good job, or he did. Actually she I can place, and this is about all and I certainly -- actually I had -- I would not have suspected -- I was quite surprised when I learned Dave had been a member of the Communist Party. In the case of Morrison, I had more political discussions. I knew we disagreed more on things than with Dave. Actually it quite startled me in his case. I don't think Dave and I ever had a political argument.

Q What was his job down there?

A He was an administrative position. Here I better make sure I am truthful on which my memory is a little vague. I think partly vague because of this peculiar arrangement I had. I was there as a consultant to the Secretary of War, and I did not go through the personnel channels. It is my impression he had dominantly to do with personnel problems and sort of administrative help and this kind of thing. He may have had to do with housing, though I don't know.

Q What about his wife. Did you know her?

A Very little only. I would recognize her if I see her.

That is about all.

Q Did you know a man there named Robert Davis?

A Yes, I did.

Q What was his job?

A Again he was in more the administrative. Later I knew his job best near the end of the war, when he was indeed writing up something of the history or something of this kind of the project.

Q Was that Davis or Hawkins?

A I would have said Davis had something to do with that.

Q Maybe he did.

A Maybe I should appeal to higher authority. I am a little vague on that. I might add on this it was felt that our end of the project was too secret and it never got written up. I think I do know what Davis is doing now. Hawkins was probably on the history. I would say that Davis was concerned, subject to correction later, with editing a series of books on the technical projects developed in the lab, the kind of thing that was to be published openly subsequent to the war. It was perfectly clear that my end of the work was never going to be published which it never has been and I had very little to do with it.

Q Did you come in contact with Davis very much down there?

A I would say a reasonable amount at the end. We were

not particularly compatible people, not particularly incompatible.

Q Did you see any indication on his part of Communist tendencies?

A Not of Communist tendencies, of a slight glumness at intervals.

Q Slight what?

A Glumness. Perhaps an undue reserve. I don't know if this has to be a Communist tendency. I didn't see anything. That is true of all concerned.

Q You never suspected him of being a Communist?

A I would never suspect. This is true of Morrison. He was more left in his political views than I, but I would not suspect him to be a member of the Communist Party.

Q You would not have suspected that Hawkins was either, would you?

A No, that is right.

Q Did you know a woman down there named Shirley Barnett?

A Yes.

Q Who is she?

A She was the wife of the medical doctor. He was our pediatrician.

Q Did she have a job there?

A She may have. There was a period of time when it was felt for economy of housing the wives were urged

vigorously to take jobs within the technical area. I t was later realized in part that this was not as good economy as we thought because the husband then at intervals had to wash the dishes, so the wife could do less important work. I think for a period of time she probably was employed!

Q I don't expect you to remember all these things.

A I will do my best.

Q Do you recall at one time she was one of Dr. Oppenheimer's secretaries?

A That may be. Pricilla Duffield was the principal of Dr. Oppenheimer's secretaries. She was the one to whom we always went. It may very well be she was.

Q Did you know Shirley Barnett well?

A Moderatdy; the best good summary is that we probably spent a total of four hours or five hours in conversation. You get to know a person fairly well, but you don't get to know everything.

Q Did you ever see any indication of Communist tendencies on her part?

A No, there was no chance for a conversation to get that far. She is not one who -- some people you get to know well enough you can do it -- in Oppenheimer's case, I would know it much better. None of these people did I know as nearly as well as I knew Dr. Oppenheimer or Wendell Furry.

Q Did you know Dr. Oppenheimer's brother Frank at all?

A Yes, I did.

Q How did you know him?

A He was an employee at Los Alamos and an assistant to Dr. Bainbridge.

Q Did you know that Frank had ever been a Communist?

A Only after I read it in the newspapers.

Q Were you surprised when you heard that?

A Yes, although -- yes, I was certainly surprised by this. There were probably other people at the lab I might have been more surprised about, including myself.

Q Did you know Mrs. J. Robert Oppenheimer?

A Mrs. Jr. Robert Oppenheimer? Yes, though not too well.

Q Did you know she had ever been a Communist?

A No, sir. Well, I did not know at Los Alamos. I was indeed told by Oppenheimer himself, in fact in conjunction with the discussions pertaining to Furry a year or so ago, that she had been a member of the Communist Party.

Q Were you surprised when you heard that?

A Well, I mean there is a surprise in each direction. It is quite conceivable; on the other hand I had no reason to anticipate it, and since the number is small, I would say yes, I was generally surprised.

Q Did you know Mrs. Frank Oppenheimer, whose name was Jackie?

A I know her chiefly by name. I did not know her well,

no, sir.

Q Did you know some people down there named Woodward?

A Woodward?

Q Yes.

A Not at Los Alamos or not well enough to be sure.

Q Doctor, I wonder if you can help us a little bit.

You said that you were a consultant or advisor to the Air Force in connection with an atomic matter.

A I am a member of the Air Force Scientific Advisory Board. I am on the Armament Panel. Until about a year or so ago when there was established also an Atomic Energy Panel of the Air Force, it was the Armament Panel that had the scientific advising responsibilities within the Air Force on atomic bombs, not atomic propoulsion.

Q How long have you been doing that for the Air Force?

A I have been doing that for the Air Force I would say since about 1946, practically since the end of the war.

Q Doctor, could you tell us in 1949 there was a lot of discussion about whether we would try the thermonuclear or whether we would not; what was the position of the Air Force on this?

A Our panel was consulted on it officially. On the other hand, this was one on which we were given more information because of the relationship to ourselves, the official advising group for the Air Force, technical people

within the Air Force doing it. In general, certainly as the briefings were presented to us of what was then available from the Air Force point of view, the delivery point of view and what kind of Air Force could be useful, it was a pretty dismal proposition. It takes a much longer time to develop an airplane than it does at our present rates to develop new bombs. It looked as if not only a new airplane but a rather fantastic airplane had to be developed. This looked like a long time proposition.

Q Did the Air Force want the thermonuclear weapon?

A There were different people within it, and we saw the men who briefed us, and they were of both opinions. It is my impression that the Air Force official policy was yes, but with considerable dissent within it, and it would not surprise me if you could produce a record which said the Air Force said it didn't. "There was just a lot of dissent in the Air Force.

Q I am just asking for information because it had not been clear to me.

A Particularly within the working groups of the Air Force with which we operated, it was such an argument of people saying what a sitting duck an airplane of this nature would be on the one hand, to people saying it is a super, it is a hooper on the other.

I would not be surprised the same way I divide it within myself, sort of 55 per cent probably for and 45 per cent

against.

Q Did the Air Force finally take an official position as to whether they wanted the weapon or whether they didn't?

A This I cannot comment on. It was never referred to us. If I knew, I don't remember. Eventually they have. They have a position now very strongly. They very much want it now. This has been in our discussion. At what year and at what time they decided they wanted it, I am completely unclear.

Q Was there some debate, Doctor, about a strategic Air Force against a so-called Maginot Line defense that you had anything to do with?

A I had problems to do with the Air Force since about, since I went to the Radiation Lab in 1941. Ever since that time there has been a very vigorous debate about strategic bombing versus tactical versus air defense. This is a very real problem the Air Force has to face. How does it distribute its funds. Within the Air Force there is at all times a considerable amount of dissent on the matter, ranging from the Strategic Air Command, -- each group essentially saying it has the important thing. I would say dominantly during almost the entire time I have had to do with it, the official position of the Air Force has always been very strongly in favor of the strategic concept.

The Scientific Advisory Board, of which I am a member is much less certain on this matter. It has many more

reservations that this is enough.

Q Just so the record will be clear, Doctor, when you speak of a strategic air force --

A We all agreed you need a strategic air force. Then it is essentially a matter of how you cut a pie. Do you put practically everything in the strategic air force with only a token air defense? Do you put an equal distribution or how do you do it? I think most people will agree you need to have a large and strong strategic air force. On the other hand, there are tactical problems.

MR. GARRISON: Mr. Chairman, I don't want to shut off discussion, and this is all very interesting, but is it relevant to the problem before the Board? I ask this question only in the interest of time, because we have two more witnesses waiting.

MR. ROBB: I thought it was, Mr. Chairman, or I would not have gone into it. I think there has been something said in the record by Dr. Oppenheimer, something about Project Vista. Didn't it have to do with that?

THE WITNESS: Project Vista had to do with essentially the ground forces, not the Air Force. Essentially the problem of Project Vista was given at Korea. How do you do something about it. This was very closely related also to the Air Force. It was a joint project supported by the Air Force, as well as the ground forces. The problem was from

the Air Force point of view how can you support ground troops and again what fraction of your money should go to that kind of a weapon. The all out strategic people would argue that the only way to do is by strategic bombing, and don't waste your money on tactical support.

BY MR. RCEB:

Q Project Lincoln.

A That was another aspect of the something. It is an air defense problem, continental defense. Again what fraction of your money should you spend to shoot down airplanes that are attacking this country, and what fraction should you spend in retaliation with your own strategic weapon. My own feeling is that you need to do both.

Q Doctor, just so the record may be clear, may I ask you this question: When you speak of a strategic air force, what is meant is not a striking force as distinguished from a defensive force?

A Well, no. It is a striking force in general to strike rather deep. A tactical air force is the one that strikes near the front lines of combat. The strategic one is the one that bombs the cities and bombs the industrial sources. They get confused. In the heat of battle they throw everything wherever it is most needed.

Q Doctor, to pull this in briefly, do you know what Dr. Oppenheimer's position was on these questions?

A I believe I know. I have had a number of discussions with him on it. I think I know fairly closely. This was the belief as mine that you need all, you need a balanced force, not exclusively or too overwhelmingly one. You need a very strong strategic air command. I believe, however, he felt that too large a fraction of the Air Force's moneys were going to that compared to the very small amount that was going to the problem of air defense. I must admit I agree with him. I am not sure that we would necessarily agree as to how much correction needs to be made. He may want to do it more or less than I.

On this I am in complete agreement and so are many members of our advisory committee board.

Q In other words, the scientists tend to favor rather the continental defense theory, is that it?

A No, I would say they favor the balanced force theory which many people in the military also favor, namely, that to defend the country, if you put all the eggs in one basket and the enemy country -- Korea was a good lesson of this -- we were actually relying, I would say, a little too heavily on some of the strategic and not enough on the tactical, and we were suddenly confronted with the situation where it was decided not to use the all out strategic weapons. I don't know of any scientist concerned with military things who thinks that we should drop the strategic air force. Almost

all I know and it is my impression that Dr. Oppenheimer would also argue that it should be the biggest part of the air force, but not the whole thing.

Q Did you have anything to do with the long range detection business?

A Only after it was invented. They tried to get me on the summer project, but my wife and I were scheduled to go on a trip to Europe, and I am afraid we went, and I didn't help very much on that. I think they originated some very important ideas on that.

Q I am cautioned that I should avoid getting into classified material on that matter.

A I think what we have said so far is all right, but we are getting close, I agree.

Q Did Dr. Oppenheimer have any part in that?

A Yes, sir. He was on the summer study group that invited that. I don't know who invented what. Certainly the net product was very important. I have discussed it subsequently and he thinks it is important and advocated strongly that it be invented.

Q Can you without getting into classified material give us Dr. Oppenheimer's position?

A I think approximately. I think his position was that the defense of the country as well as its ability to retaliate was a very important thing, which was being under-

developed. There had now been invented some techniques which would be of a vast aid in this which were simply not thought of before. In order to strengthen our country, we needed to put more support behind this.

I might add that this is now to the best of my knowledge part of the official policy of the United States.

Q Was there more than one technique without getting into classified material?

A There are a number of intermixed techniques in this. You use all. I would say that the most important of the new ideas is the one you referred to and I will avoid having to refer to it myself.

Q Were there three fundamental techniques, Doctor?

A The usual thing when you categorize things --if you name them, I will agree with them maybe.

Q I will ask a question that maybe will wind it up. Was there any technique that Dr. Oppenheimer opposed?

A I don't know. It is on the record that at least one time he opposed development of an H bomb.

Q I am talking about this long range detection?

A I don't know of any, no, sir. There may be, but I certainly do not know it.

MR. OPPENHEIMER: I know this is not a classroom, but the counsel and the witness are talking about two quite distinct things and therefore they are not understanding each

other.

MR. ROBB: I realized that, too, on the last question. I don't think the witness understood my question.

BY MR. ROBB:

Q I was talking about this long range detection matter, Doctor. I asked you whether there was more than one technique for long range detection, and I believe you said there was.

A Sure.

Q The question I asked you was there any technique that Dr. Oppenheimer opposed?

A Not to my knowledge. I thought you meant a non detection technique.

Q One further question. Was there a man down at Los Alamos while you were there named David Greenglass?

A I never met him, but I obviously read about him in the paper. I believe he was a machinist.

Q You didn't know him?

A Never saw him.

MR. ROBB: Thank you very much.

MR. GRAY: Dr. Ramsey, with respect to the compartmentalization versus non-compartmentalization, I believe you indicated that this was a technique which had been used in some other laboratories, and was found to be useful as far as the expedition of work was concerned at Los Alamos?

THE WITNESS: Correct.

MR. GRAY: Am I right, however, in recalling that you said that you were in a compartmentalized area?

THE WITNESS: I would say semi-compartmentalized.

MR. GRAY: Because of the extreme secrecy?

THE WITNESS: And also from the lack of necessity of knowledge of technical development. The point of view that certainly most of us adopted was in the best interests of the country, what will speed things versus what will risk security. In my own group there wasn't much advantage to have the interchange that was so necessary to the development in the rest of the group, and there was also this particular secret aspect that my group indicated how far we were coming along.

MR. GRAY: So in the absence of the desirability on the ground of expedition of the work, compartmentalization was a security measure which was adhered to?

THE WITNESS: Yes, I incidentally believe that what was done on the compartmentalization there was very good indeed, and the non-compartmentalization. I think it would have been vastly later had it not been for that.

MR. GRAY: One other question about Los Alamos. You were not allowed to leave the premises without permission, is that correct?

THE WITNESS: This varied a little from time to time. We always had to show passes at the gate.

MR. GRAY: No.

THE WITNESS: For any extensive visit you had. I think you could go to Santa Fe to do shopping without higher authority.

MR. GRAY: Who was in charge of that?

THE WITNESS: We showed our passes to the guard at the gate. I would say probably Colonel de Silva.

MR. GRAY: It would be the security people.

THE WITNESS: Yes, it would be the security people.

MR. GRAY: On your formula 5545, had you served on a committee or in some other capacity at that time and in such capacity been required to vote on the crash program, I assume that the 55 per cent --

THE WITNESS: That is correct.

MR. GRAY: There comes a time when a man -

THE WITNESS: Has to make a decision, that is correct. One important argument might have reversed the 55 the other way. I would have to face that. That is correct. I would have voted in that time in favor of it.

MR. GRAY: You pretty well knew the various arguments?

THE WITNESS: I think I knew most of them. I did not know all of them. I certainly respected those people. There were many who disagreed with me.

MR. GRAY: Yes, I understand that. Just in the interest of my understanding the record, in talking about Dr.

Furry, you said he could not have joined the Communist Party in 1940. What did you mean by that?

THE WITNESS: I can tell you what I mean. I realized this when I said 1940. This was the time of the Nazi-Soviet agreement, and I do know also from the testimony that he almost got out at that time. Actually he didn't get out at that time. But he almost did. Essentially by that argument I am saying that I think it would have been very unlikely that would have been the moment at which he initiated the move of getting in. It is because also I remember he had been in before that period.

MR. GRAY: Yes. I was trying to get that clear. Whether you are saying that it could not have been 1940 had to do with your recollection or had to do with an international situation.

THE WITNESS: I would say it actually had to do with both. I think it was dominantly recollection. As I started to say this, I remember the 1938 date. But what I know of him I think this would not have been the date he would have chosen. It is the period of the collapse of France and the Nazi-Soviet pact. I am sure he would not have chosen that as joining. He was very upset about it, and in fact dropped going from all meetings.

MR. GRAY: You said he almost resigned.

THE WITNESS: Yes. As a matter of fact, if it were

not that he moved so slowly -- it took him about a year to make up his mind to drop out by which time Russia was an ally.

MR. GRAY: There have been a lot of allegations about the fact that people at Harvard and other institutions have been involved -- I don't mean to single out Harvard -- but they have been.

THE WITNESS: That is correct.

MR. GRAY: Of course, Dr. Furry's name has appeared publicly along with three others at the sametime.

THE WITNESS: There have been a total of three. Actually one of them is no longer teaching at Harvard. He was on a temporary appointment. One has an appointment terminating this year. Furry is the only permanent member of the tenure appointment in the Harvard faculty for which this is true.

MR. GRAY: Were these others known to you?

THE WITNESS: No, I never met any of them. Incidentally, Kaneman, our other most conspicuous case, Furry has never met him. I am sorry they saw each other at a hearing.

MR. ROBE: Is that Martin Kaneman?

THE WITNESS: It is a good question. I think it is Leon. I am quite sure.

DR. EVANS: Dr. Ramsey, would you tell us about your undergraduate and graduate education and where you had them.

THE WITNESS: Yes, sir. I received my bachelor's degree from Columbia University. I was given a traveling

fellowship by Columbia University to go Cambridge University where I did the peculiar thing -- the universities are different -- I received another bachelor's degree from Cambridge University, subsequently a master's degree. I came back and got my Ph. D. degree from Columbia.

DR. EVANS: Did you meet a Bernie Peters down there at Los Alamos?

THE WITNESS: I certainly didn't meet him at Los Alamos. I met him at Richester subsequently, and I didn't realize he had been at Los Alamos.

DR. EVANS: Did you meet Lomanitz down there?

THE WITNESS: No, sir.

DR. EVANS: Rossi?

THE WITNESS: No, sir.

DR. EVANS: Did you meet Weinberg down there?

THE WITNESS: At Los Alamos?

DR. EVANS: He was at Berkeley.

THE WITNESS: I think he was at Berkeley. As a matter of fact, I never met Weinberg.

DR. EVANS: Did you meet Ma Flanders down there?

THE WITNESS: Yes, he was a mathematician.

DR. EVANS: Yes, he was an electronic mathematician.

THE WITNESS: He was in the computing. It was mathematics at first. It gradually developed into electronics.

DR. EVANS: Did he have his beard?

THE WITNESS: He had his beard, and it started the security guards no end.

DR. EVANS: You say you knew Fuchs?

THE WITNESS: Fuchs, under sworn testimony I would have to say to the best of my knowledge I have never seen the man, and I couldn't even prove he was ever at Los Alamos.

MR. GRAY: Forgive me for reminding you, that you are giving sworn testimony.

THE WITNESS: That is correct. I was about to say if I were, and realized that I am.

DR. EVANS: Some of these people that you knew down there in this cell at Harvard, a number turned out later to be Communists.

THE WITNESS: Yes, actually the only member of the group at Harvard that I ever met was Furry. This was subsequent to his membership.

DR. EVANS: You knew Hawkins, you said.

THE WITNESS: Yes. I am sorry. At Los Alamos I knew the people I have enumerated, including Hawkins.

DR. EVANS: From what you know now, and thinking back, would you think you are a very good judge as to whether a man is a Communist or not?

THE WITNESS: I would say yes, I think on the following. I mean since you were not trying to judge, you can guess some people might be and some were not. I don't think you can

explicitly with someone you don't know terribly well as with all the ones I have enumerated, my conversation runs to maybe a total of four or five hours, I certainly would have had no claim with anyones enumerated would I ever have felt in a position of saying they weren't. I would not have been in a position to claim they were or were not. Simply I didn't know them well enough. I don't think ability to judge enters there. A person whom I never met I can't say anything. A person whom I met only casually, chiefly to talk about the physics problems, is no way to judge.

DR. EVANS: That is all.

MR. GRAY: Mr. Garrison?

MR. GARRISON: No.

MR. GRAY: Thank you very much.

THE WITNESS: Thank you. Sorry to have taken so much of your time.

(Witness excused.)

(Brief recess.)

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

DR. RABI: Certainly.

MR. GRAY: Would you be good enough to raise your right hand. I must ask for your full name.

DR. RABI: Isadore Isaac Rabi.

MR. GRAY: Isadore Isaac Rabi, 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. RABI: I do.

Whereupon,

ISADORE ISAAC RABI

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

MR. GRAY: Would you be seated, please, sir?

I must remind you of the existence of the perjury statutes. I am prepared to give you a description of the penalties if you wish, but may I assume you are generally familiar with the perjury statutes?

THE WITNESS: I know that they are dire.

MR. GRAY: I would also ask, Dr. Rabi, that you notify me in advance about the possible discussion or disclosure of any restricted data which you may get into or find necessary to get into your testimony.

THE WITNESS: I hope to have the help of Dr. Beckerley on that.

MR. GRAY: He is here and I am sure will be alert.

THE WITNESS: I am confused about what has been declassified that I want technical professional help.

MR. GRAY: Finally, I should point out to you that we regard the proceedings of this Board as a matter confidential in nature between the Commission and its officials and Dr.

Oppenheimer, his representatives and witnesses. The Commission will make no public release of matters pertaining to these proceedings, and on behalf of the Board, I make it a custom to express to the witnesses the hope that they may take the same attitude.

THE WITNESS: Yes, sir.

DIRECT EXAMINATION

BY MR. MARKS:

Q Dr. Rabi, what is your present occupation?

A I am the Higgins Professor of Physics at Columbia University.

Q What official positions do you have with the government?

A Let me see if I can add them all up.

Q Just the most important.

A At present as Chairman of the General Advisory Committee, as successor to Dr Oppenheimer. I am a member of the Scientific Advisory Committee to ODM, which also is supposed to in some way advise the President of the United States.

I am a member of the Scientific Advisory Committee to the Ballistics Research Laboratory at Aberdeen Proving Ground. I am a member of the Board of Trustees of Associated Universities, Inc., which is responsible for the running of Brookhaven Laboratory. I am a consultant to the Brookhaven

National Laboratory.

I was a member of the Project East River, but that is over. I was at one time the Chairman of the Scientific Advisory Committee to the Policy Board of the Joint Research and Development Board, and a consultant there for a number of years. I am a consultant to Project Lincoln.

That is about all I can remember at the moment.

Q That is enough. Speaking roughly, how much of your time do you devote to this official work?

A I added up what it amounted to last year, and it amounted to something like 120 working days. So you might ask what time do you spend at Columbia.

Q How long have you been a member of the General Advisory Committee?

A Since its inception. I don't remember the exact date of my appointment but I have been to every meeting. I may have missed one since the first.

Q When did you become Chairman?

A I became Acting Chairman when Dr. Oppenheimer's term was out. By our own custom the Chairman is elected at the first meeting of the calendar year, and I was elected Chairman by the committee at the first meeting which I think was in January of last year. I am not sure of the date of the meeting.

Q Dr. Rabi, to what extent has your work as consultant in various capacities in the government overlapped or

coincided with work that Dr. Oppenheimer was performing at the same time and in the same general field?

A Chiefly of course the General Advisory Committee and also to a degree in Project Lincoln, and particularly the summer study of, I believe, 1952.

Q Summer study where?

A This was a summer study at Cambridge on the question of continental defense of the United States.

Q How long have you known Dr. Oppenheimer?

A I think we first met in the end of 1928 and we got to know one another well in the winter and spring of 1929. I have known him on and off since. We got together very frequently during the war years and since.

Q Do you know him intimately?

A I think so, whatever the term may mean. I think I know him quite well.

Q Mr. Rabi, if you will indulge me I would like to skip around somewhat because as nearly as possible I would like to avoid too much repetition of things that have already been gone into by others.

Will you describe the extent that you can what took place in the fall of 1949 in so far as the GAC was concerned or you are concerned in respect of the question of thermonuclear program for the Atomic Energy Commission?

A I can only give my own view and my own recollection.

I have not prepared myself for this by studying the minutes. I intended to, but I am on in the morning rather than the afternoon. So I can give you just my own recollection.

The thermonuclear reaction or as it was called the Super was under intense study from my very first contact with Los Alamos.

Q When was that?

A About April 15, 1943. At the establishment of the laboratory, Dr. Oppenheimer called together a group of people to discuss the policy and technical direction of the laboratory, and I was one of those who was invited to that discussion. All through the war years and following that, that was a subject of discussion and consideration by some of the very best minds in physics.

The problem proved to be an extremely difficult, very recalcitrant problem, because of the many factors which were involved where the theory, the understanding of the thing, was inadequate. It was just a borderline. The more one looked at it, the tougher it looked.

Following announcement of the Russian explosion of the A bomb, I felt that somehow or other some answer must be made in some form to this to regain the lead which we had. There were two directions in which one could look; either the realization of the Super or an intensification of the effort on fission weapons to make very large ones, small ones, add so

on, to get a large variety and very great military flexibility.

Furthermore, a large number, a large increase in the production of the necessary raw materials, the fissionable materials and so on, or one could consider both. There was a real question there where the weight of the effort should lie.

Q When would you say that this question that you are now describing began to become acute in your thinking?

A Right away.

Q You mean with the Russian explosion?

A As soon as I heard of the Russian explosion. I discussed it with some colleagues. I know I discussed it with Dr. Ernest Lawrence, with Luis Alvarez, and of course with the Chairman of our Committee, Dr. Oppenheimer. In fact, I discussed it with anybody who was cleared to discuss such matters, because it was a very, very serious problem.

That question then came up at the meeting of the General Advisory Committee.

Q That would have been the meeting that began on October 29, 1949?

A Yes. I do not recollect now whether this was the first meeting after the announcement of the Russian explosion or whether there was an intervening meeting.

Q To refresh your recollection, Dr. Rabi, I think it has been in the record here that there was a regular meeting of the General Advisory Committee just after or just at the

time when the Russian explosion was being evaluated.

A Yes. I recollect now. In fact, I was coming up on the airplane and there was Dr. Cockroft, the Director of Harwell -- he didn't tell me what it was -- but he said you will read something very interesting in the newspaper.

Q You were coming on the airplane from where?

A From New York to Washington on the airplane. I ran into Dr. Cockroft, and he told me I would read something very interesting in the noon paper. When I stepped off the plane there was the Star with this announcement.

Q This meeting which you identified was more or less contemporaneous by the official announcement of this government that there had been a Russian explosion, was there any discussion at that time of the thermonuclear?

A I would have to refresh my memory on that. I can not say. I would be astonished if there were not. I can not say. I could go back and look. In fact, we talked about it at every meeting.

Q In all events, the interval between that meeting and the one on the 29th, was very much on your mind?

A Yes, sir.

Q Do you have any recollection or impression as to the form in which the question of what to do about the thermonuclear problem came up in your meeting that began on October 29?

A The way I recollect it now, without perusal of the

minutes -- in fact, I think we kept no minutes of that meeting which is somewhat unfortunate under the present circumstances -- the way I recollect --

Q Do you know why no minutes were kept?

A Because the discussion ranged so very widely. We were concerned during that period, as I remember and we consulted with the Joint Chiefs of Staff, we consulted with representatives of the State Department and a whole lot of stuff was there which we didn't feel should be distributed around. We decided not to keep accurate minutes of the meeting.

What was the question again?

Q I asked you whether you had any recollection or any impression as to the form in which the question concerning the thermonuclear problem came before you, that is, the GAC, at the meeting which began on October 29, 1949.

A As I recollect it now -- it is five years ago -- the Chairman, Dr. Oppenheimer, started very solemnly and as I recall we had to consider this question. The question came not whether we should make a thermonuclear weapon, but whether there should be a crash program. There were some people, and I myself was of that opinion for a time, who thought that the concentration on the crash program to go ahead with this was the answer to the Russian thermonuclear weapon. The question was, should it be a crash program and a technical question: What possibilities lay in that? What

would be the cost of initiating a crash program in terms of the strength of the United States because of the weakening of the effort on which something which we had in hand, namely, the fission weapons, and the uncompleted designs of different varieties, to have a really flexible weapon, the question of interchangeability of parts, all sorts of things which could be used in different military circumstances.

Then there was the question of the military value of this weapon. One of the things which we talked about a great deal was that this weapon as promised which didn't exist and which we didn't know how to make, what sort of military weapon was it anyway? What sort of target it was good for. And what would be the general political effect.

In other words, we felt -- and I am talking chiefly about myself -- that this was not just a weapon. But by its very nature, if you attacked a target, it took in very much more. We felt it was really essential and we discussed a great deal what were you buying if you got this thing. That was the general nature of the discussion.

Technical, military, and the combination of military political.

Q Dr. Rabi, if in the state of mind that you have described the question among others had been put to you by the Commission or its Chairman to consider an appraisal of the then program of the Atomic Energy Commission of whether it was

adequate and if not, what to do about it, what you would have considered a question in those general terms embraced.

A Are you referring specifically to the thermonuclear weapon or to the whole program?

Q I am referring to anything that you think of. Would that have embraced the thermonuclear?

A The thermonuclear weapon at Los Alamos went through ups and downs. We spent a lot of time talking of how we could get some very good theoretical physicists to go to Los Alamos and strengthen that effort. We thought at times of the effort as being such a distant thing that working on that kind of research because it was a distant thing and new ideas would evolve and would really act as a ferment and sort of spark the laboratory. It was one of those things where you really didn't know how to find a way. Where experiments were really difficult to make and tremendously expensive.

With the ideas in hand it was very hard to know how to go at this thing, even how to set up a crash program. But what we were concerned about on the other hand, we felt that there was a very great inadequacy in the Commission's program with respect to the production process, the amounts of fissionable material, and the amounts of raw material which were being produced, that we were not spending enough money on that.

We felt almost from the very beginning of an increase

in Hanford. We made a technical recommendation at the time of how more could be gotten out of Hanford. About hastening the construction of certain chemical plants for the purification of the material. It was our feeling that the resultant controversy when the President ordered Savannah River that the whole controversy was worth the thing.

Q You are getting ahead of me.

A You asked such a broad question.

Q I am losing track of this. Just once more, to search your memory, and if you haven't got any, all you have to do is say so -- search your memory as to the form in which, the nature of the circumstances in which there was before the General Advisory Committee in the capacity as such at the October 29 --

MR. ROBB: 1949 meeting.

MR. MARKS: I am sorry.

BY MR. MARKS:

Q At the October 29, 1949 meeting. The sense that you were appropriately considering the question of a crash program for the Super. If you haven't got any memory, say so.

A The sense of whether we were considering a crash program for the Super?

Q Do you have any memory as to how that question was before you? Among lawyers we say how did the question come up in the case.

A You mean in detail how it came up? You mean who said what to whom, when? That I don't remember. I am sure it was before us.

Q You don't know who presented it?

A How it was presented, whether it was first presented with our preliminary meeting with the Commissioners, whether it was first suggested by Dr. Oppenheimer, and then confirmed in the preliminary meeting with the Commissioners, and so on. I really don't remember. At other meetings we have minutes and all this would have been spelled out.

Q To the extent that you can tell it without getting into any classified material, what was the outcome of the GAC meeting of October 1949?

A I will try to give it as best I can.

Q Let me break it down. First, is it fair to say that the committee was in agreement with respect or essentially in agreement with respect to the technical factors involved in the thermonuclear situation?

A It was hard to say whether there was an agreement or not because what we were talking about was such a vague thing, this object, that I think different people had different thoughts about it. You could just give a sort of horseback thing and say, maybe something would come out in five years. It is that sort of thing. I know in my own case I think I took the dimmest technical view of this, and there are others

who were more optimistic.

Q I think it has been indicated here that there was some statement in the report of the GAC at that time to the effect that it was the opinion that a concerted imaginative effort might produce -- that there was a 50-50 chance of success in five years.

MR. ROBB: In the interest of accuracy, I think the report says a better than even chance. Let me check it to make sure.

MR. GARRISON: That is correct.

BY MR. MARKS:

Q Was that supposed to be a concensus of the views?

A More or less. When you are talking about something as vague as this particular thing, you say a 50-50 chance in five years, where you don't know the kind of physical factors and theory that goes into the problem. I just want to give my own impression that it was a field where we really did not know what we were talking about, except on the basis of general experience. We didn't even know whether this thing contradicted the laws of physics.

Q You didn't know what?

A Whether it contradicted the laws of physics.

Q In other words, it could have been altogether impossible.

A It could have been altogether impossible. The thing

we were talking about. I want to be specific.

Q I understand.

A We were talking within a certain definite framework of ideas.

Q To the extent that you can describe them now and confining yourself to that meeting, to the extent that you can describe them without trespassing on classified material, what were the recommendations of the GAC?

A They were complicated. We divided into two groups. No, there were some recommendations to which I think we all agreed, which were specific technical recommendations.

Q Can you say what they had to do with in general terms?

A Certain improvements in weapons, the production of certain material which would be of great utility in weapons and which we felt at the time might be fundamental if a super were to be made. We recommended sharply a go-ahead on that. We recommended certain directions of weapons and there was a third important recommendation which I don't recollect now of a technical nature.

Q You have spoken of a division. What had you reference to there?

A In addition to that there were supplementary reports on which Dr. Fermi and I formed a minority, and the other six members present the majority. That had more to do with this

sphere where the political and the military impinge. One group felt -- I don't like to speak for them because the record is there,, but my impression was -- that this projected weapon was just no good as a weapon.

Q You mean the particular weapon?

A I am not talking from the technical but the military opinion. That it was not of great military utility. The possible targets were very few in number, and so on. I could elaborate on that if I should be asked, but I am speaking for somebody else, and there is a record.

Q That was the group with which you did not join?

A Yes. Of this specific design, Dr. Fermi and I as I recollect it now felt that in the first place as far as we could see from the question of having a deliberable weapon one did not gain a tremendous amount. Secondly, we felt that the whole discussion raised an opportunity for the President of the United States to make some political gesture which would be such that it would strengthen our moral position, should we decide to go ahead with it. That our position should be such that depending on the reaction, we would go ahead or not, whatever going ahead were to mean.

Q What made you think that it was appropriate for you to speak about these rather non-technical but more political, diplomatic and military considerations?

A That is a good question. However, somehow or other

we didn't feel it was inappropriate. In our whole dealing with the Commission, we very often, or most often, raised the questions to be discussed. In other words, we would say we want to discuss this and this thing. Would you please provide us with documents, would you bring individuals to talk to us on this, and we would address the Commission on questions.

On the other hand, we didn't feel badly if they didn't act on our suggestions. Sometimes they did and sometimes they didn't. So we did not feel that this was inappropriate. It would be very hard for me to tell you now why we thought it was appropriate, but we thought so.

Q After this meeting of the GAC, the outcome of which you described --

A I might add, to add to your feeling on this, the Joint Chiefs consented to come and talk to us, and gentlemen from the State Department came and talked to us. So we did not have the feeling all along that we were going far beyond our terms of reference; otherwise these people would not have showed up.

Q If you can properly say so, Dr. Rabi, to what extent and in what way did the appearance of the Joint Chiefs or their representatives affect the course of your thinking and your expression of view?

A Oh, dear, that is very hard to remember. I can only talk for myself. I, myself, I don't want to talk for

anybody -- I had the sort of discouraged feeling that they were not very well briefed on the whole question of atomic weapons and their military utility. There was a very great pity. If they had been very well briefed on that we would have been where we are now three or four years ago.

MR. ROBB: Three or four years what?

THE WITNESS: Three or four years ago. That is the general feeling I got out of it.

BY MR. MARKS:

Q Did the GAO have any responsibility for seeing to it that the Joint Chiefs were briefed?

A No. We did meet fairly frequently with the Military Liaison Committee.

Q Is it fair to say that the GAC tried to keep the Military Liaison Committee fully informed?

A Our job was not to inform the Military Liaison Committee. Our job was definitely to talk to the AEC and as we interpreted it on the suggestion of the Chairman of the AEC at one time, to the President on some very special occasion. We have tried then and since not to be the servant of the MOC or to work directly through them or the Joint Congressional Committee. Our job is to work with the AEC as specified in the law and possibly with the President.

Q After the President announced the decision to go ahead with the hydrogen bomb in January of 1950, what attitude

and what steps, if any, did the GAC take with respect to the subject from then on?

A I think we started talking about the best ways and means to do it. It was a very difficult question, because here is a statement from the President to do something that nobody knew how to do. This was just a ball of wax. So we were really quite puzzled except in so far as to try to get people to go and look at the problem.

Q In that connection, did the GAC itself try to look into the problem?

A In so far as we could, yes. We had people who were quite expert and actually worked on it, chiefly of course Dr. Fermi, who went back to Los Alamos, summers and so on, and took a lot of time with it. So we had a very important expert right on the committee. Of course, Dr. Oppenheimer knew very well the theoretical questions involved.

Q Do you think the GAC had any usefulness in helping the work on this particular subject?

A I think it did; I think it had a great usefulness some way indirect and some way direct, ways of trying to bring out the solid facts. It is awfully hard to get at those facts. I recall particularly one meeting, I think it was in the summer of 1950 at Los Alamos, I am not sure of the dates, where we actually got together all the knowledgeable people we could find, I think Dr. Bethe was there and Fermi, to try to produce

some kind of record which would tell us where we stood. This was before the Greenhouse test.

Q You mean what the state of the art was at that time?

A What the state of the art was, and where do we go from here.

Q How many of the laws of nature on the subject were available?

A What ideas and what technical information was available. We got this report and it was circulated by the Commission in various places because there was some kind of feeling that here the President is given the directive and somehow something is going to appear at the other end and it was not appearing.

Q If you can tell, Dr. Rabi, what was the connection or relation between the meeting you have just described at Los Alamos and another meeting that has been testified here which took place, I believe, in 1951, in the late spring at Princeton?

A That was an entirely different meeting. At that meeting we really got on the beam, because a new invention had occurred. There we had a situation where you really could talk about it. You knew what to calculate and so on, and you were in the realm where you could apply scientific ideas which were not some extrapolation very far beyond the known. This is something which could be calculated, which could be studied,

and was an entirely different thing.

Q Why did it take that long?

A Just the human mind.

Q There was the President's directive in January 1950.

A Why it took this long? One had to get rid of the ideas that were and are probably no good. In other words, there has been all this newspaper stuff about delay. The subject which we discussed in the 1949 meeting, that particular thing has never been made and probably never will be made, and we still don't know to this day whether something like that will function.

This other thing was something quite different, a much more modest and more definite idea on which one could go.

Q I interrupted you a while back when you displayed some enthusiasm with the Savannah River Project. Would you try to fix in point of time when you intended that expression of enthusiasm?

A Just as soon as we got some more money to make more plants which would make fissionable material and really here was a policy of containment.

Q When was that?

A I specifically was worried about the whole thing from 1947 on when we started to get a tough policy with Russia with a minuscule stockpile and if our bluff were called, what would we do? I felt all along if we are going to have a get

tough policy, we have to have something to back it up.

Q Did you and Dr. Oppenheimer disagree about that?

A No, oh, no. We were worried sick about that particular situation. We were also worried about the situation that the military did not know the meaning of these weapons and somehow or other had a fixed idea that these necessarily were-- they could not be made to realize or did not realize, there was some kind of breakdown in communication, that all they had to do was to put the money on the line and order it, and this would come out. There were very many important military uses. So when the Savannah River project came along --

Q When was that?

A The date of Savannah River, I can't recall.

Q That would have been some time in 1950?

A I don't know. I can't put a date on it. But it was extremely welcome.

Q You say that you began to experience these worries about talking tough and not having a big stick in 1947. Did the GAC try to do anything about that, or did you feel you had any responsibility to do something about it?

A Yes, we did talk to the Commission about it, I think. I am not quite sure we did. I think at our first or second meeting, whether it is in the record or not or in the minutes, I am not sure, I know I myself kept on saying what we have to do is to quintuple Hanford. I am quite sure that would have been unanimous in the committee. Also, there were

certain technical devices to increase the production and we pressed on that. There was a very long delay just because of conservatism, and a new contractor, and so on, in doing some of those things. But the pressure of the GAC all along --

Q When you say all along, what do you mean, 1947, 1948, 1949?

A At almost every meeting.

Q Through all of those years?

A That is right. Increased production of both fissionable material and of raw material, and particularly we kept on recommending a facility for the production of neutrons which we knew would be very useful in some way or other without particularly specifying where the use would come.

Q Was Savannah River regarded by you as one of the great answers to that need which you have just described?

A Oh, yes, I regard Savannah River as the way we answered the Russian success.

Q I don't know whether you said earlier what Dr. Oppenheimer's view was about that.

A I am quite sure that he was never in disagreement with that.

Q Was never in disagreement?

A Yes.

Q Did he evidence your enthusiasm?

A I think so. He is not the same enthusiastic fellow

as I am, but I was quite sure he believed that it was a correct step.

Q Dr. Rabi, there has been some questioning and some talk by other witnesses about a subject which is somewhat obscure to me, but perhaps if I just identify it, you may be able to say something about it, namely, the question of a so-called second laboratory. Is there anything that you can say properly on that subject?

A I will try and let Dr. Beckerley watch me on it.

Q Maybe you better consult with Dr. Beckerley first.

A That question came up again and again. Los Alamos is an awkward place and so on, and various people kept on saying --

Q May I interrupt you, Dr. Rabi. When the term "second laboratory" is used, is it fair for me to assume that what is being talked about is the second laboratory which will have something to do primarily with weapons?

A That is what I am talking about. I am just giving you my recollection of a whole series of discussions which came up from time to time. That competition is good. Los Alamos has been criticized for being too conservative and stodgy. The suggestion that some other group utilizing talent which for some reason or another was unobtainable at Los Alamos would be a good thing.

I, myself, I may say was not in favor of that, and

my own reason was -- and I think Dr. Oppenheimer shared this reason, at least in part -- that Los Alamos was a miracle of a laboratory. If you had looked at the dope sheet of the people that were there, you would not have expected in 1945 that it would be just a tremendously successful laboratory and of such a very high morale. It was really a terrific laboratory, just a miracle of a place.

As a result of establishing another laboratory, I was afraid that it would be taken <sup>at</sup> Los Alamos as a criticism and taking chances of spoiling morale. Those laboratories, as I think Mr. Morgan will know, largely depend upon the few key people. If you are to lose them, you have lost the lab. So my own feeling was, they are doing remarkably well and why upset the applecart. There was a possibility also that they would lose some personnel in a sort of general division.

Finally it turned out in the expansion of the activities of Los Alamos, these various tests and so on, that they used a lot of the contractors all over the place. They do a tremendous amount of subcontracting all over the place.

Q All over the place?

A All over the United States. One very good group in instrumentation was developed at Berkeley by Dr. York.

Then there was an additional circumstance that some important contract on a subject which I won't even enter was cancelled there, and personnel became available, and I think

it was a suggestion of the GAC that that group should be combined and another laboratory made whose chief terms of reference would be in the realm of instrumentation for the study of explosions.

Subsequently, and I think not on the direct recommendation, although I am not sure about the record, but this is my recollection, the terms of reference of that laboratory were expanded, so that it became an actual second weapons laboratory. I think in popular opinion such as Time Magazine, and so on, it is that laboratory which produced the thermonuclear weapon. That is a lie.

MR. GRAY: That is what, Doctor?

THE WITNESS: That is a lie.

BY MR. MARKS:

Q Do you mean by that to say that what has been produced came out of Los Alamos?

A Yes, sir.

Q There has been a good deal, I think, of official information about the present strength of the United States in relation to nuclear weapons, fission and fusion. Is that in your opinion the result of work at Los Alamos?

A Yes, it is my unqualified opinion.

Q And not the second laboratory?

A Not the second laboratory. The second laboratory has done very good work on instrumentation.

Q There has also been some talk as a result of questioning in these proceedings about the question of continental defense. Is there anything that you can say properly about that subject, about your attitude on it, and about Dr. Oppenheimer?

A I can suggest the motivation and I think Dr. Oppenheimer and I agreed. It is three fold. One, we think that to protect the lives of Americans is worth anybody's while. Two, that one is in a stronger position in a war if one is fighting from a protected citadel, rather than just being open and just a slugging match with no defense guard put up. Thirdly, and it is more political, that the existence of such a defense would make us less liable to intimidation and blackmail.

Behind this were some brand new ideas, at least new to me, which came from some individuals in Cambridge, particularly Dr. Zacharias, which made such a defense line possible at a reasonable cost.

Q Who is Dr. Zacharias?

A Dr. Zacharias is a professor of physics at MIT. He is the head of their Division of Nuclear Science. During the war he was at the Radiation Laboratory at MIT on radar. He spent a certain amount of time at Los Alamos. He was the head of the Hartwell Project, summer study for the Navy, which had a large effect on naval policy on antisubmarine warfare,

and things of that sort.

Q Are you sure you are not mistaken about the Hartwell business?

A Zacharias was the head of the Hartwell study. Then also he ran the summer study.

Q When you speak of the summer study, you mean the one that is popularly called Project Lincoln?

A No, Project Lincoln is a big project and laboratory which exists. The summer study was a special group brought together for a limited period of time of experts in different fields to look into the technical military question of the possibilities of the defense of the United States.

Q Were you and Dr. Oppenheimer concerned at all with that?

A I think we each spent a week or so at the beginning and a week or so at the end of this. We were not actually members of the working party.

Q You were consultants?

A Consultants.

Q Does the attitude that you have described on the subject of continental defense mean that you are opposed to a powerful strategic air policy?

A As far as I am concerned, I certainly am not.

Q Am not what?

A Opposed to it. I am very much in favor of it. I

would like to see it more effective than it is, and also I would like to see its bases better protected than they are.

Q Are the two things compatible, the continental defense you are talking about, and the strategic?

A Absolutely. These are the two arms. One is the punching arm and the other the guard. You have to have both, in my opinion.

Q Do you know whether Dr. Oppenheimer's views are materially different from yours on the subject?

A I don't think they are. I think his emphasis might be somewhat different. I don't think the views are different. I think the emphasis might be different.

Q In what way?

A Now we are getting into things which I would prefer not to answer.

Q Why?

A Because it comes into questions of actual strategy and tactics of which we have special knowledge and I don't want to go into any details of that sort.

Q All right. Just so that I will understand what you are saying, I take it that you strongly favor, and to your knowledge Oppenheimer strongly favors, a powerful strategic air policy.

A Yes.

Q And that you also favor an effective continental

defense.

A That is right.

Q And that you regard the two things as not incompatible?

A No, no. I think they are just absolutely complementary. They both have to be there. To put it in a word, a strategic air arm unless you are going to prevent a war is a psychological weapon, a deterrent. But the other fellow may not be the same and you have to have some kind of defense before he does you irreparable damage, and furthermore, your plans may not go as you expect. They may miscarry. Unless you have a defense, you are not getting another chance.

DR. GRAY: Let me interrupt for a moment to ask you how much longer do you think your direct will take?

MR. MARKS: Just two more questions. If you would rather --

MR. GRAY: No, proceed.

BY MR. MARKS:

Q Doctor, it can be gathered from the nature of these proceedings that this board has the function of advising the Commission with respect to a determination that the Commission must make on whether permitting Dr. Oppenheimer to have access to restricted data will not endanger the common defense and security.

In formulating this advice, the considerations

suggested by the Atomic Energy Act to be taken into account are the character, associations and loyalty of the individual concerned.

Do you feel that you know Dr. Oppenheimer well enough to comment on the bearing of his character, loyalty and associations on this issue?

A I think Dr. Oppenheimer is a man of upstanding character, that he is a loyal individual, not only to the United States, which of course goes without saying in my mind, but also to his friends and his organizations to which he is attached, let us say, to the institutions, and work very hard for his loyalties; an upright character, very upright character, very thoughtful, sensitive feeling in that respect.

With regard to the question of association, I might say that I have seen the brief form of what would you call it, the report of Dr. Oppenheimer?

Q What is that?

A It is some document about 40 pages which is a summary.

Q When did you see it?

A Sometime in January.

Q How did you happen to see it?

A The Chairman of the Commission asked me to take a look at it.

MR. GARRISON: What year?

THE WITNESS: This year. I would say that in spite

of the associations in there, I do not believe that Dr. Oppenheimer is a security risk, and that these associations in the past should bar him from access to security information for the Atomic Energy Commission.

BY MR. MARKS:

Q The report you speak of, is that in amplification of the letter of allegations or derogatory information which you have read of General Nichols to Dr. Oppenheimer?

A I don't know whether it was made as an amplification.

Q I am just trying to get some sense of what it is.

A I don't know. I understood it to be a digest of a very big file.

Q I didn't understand clearly, Dr. Rabi. You used the phrase "bar him". Would you mind repeating what you had in mind?

A I will put it this way. If I had to make the determination, after having read this and knowing Dr. Oppenheimer for all the years I would know him, I would have continued him in his position as consultant to the Atomic Energy Commission, which he was before.

MR. MARKS: That is all.

DR. GRAY: Are you ready to proceed with the examination?

MR. ROBB: Mr. Chairman, it is now about 1:15. I am going to take 45 minutes anyway, and of course we have no

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MR. MARKS: That is all.

DR. GRAY: Are you ready to proceed with the examination?

MR. ROBB: Mr. Chairman, it is now about 1:15. I am going to take 45 minutes anyway, and of course we have no

lunch. I would much prefer to take a brief break to get a cup of coffee and a sandwich before proceeding.

(Discussion off the record.)

DR. GRAY: We will now recess until 2 o'clock.

MR. GARRISON: Mr. Chairman, is there any more news about the schedule for next week? You said the Board might be calling witnesses, and would let us know what you have decided.

MR. GRAY: I am afraid we will have to talk about that some at lunch, because I don't have anything new at the moment.

(Thereupon at 1:05 p.m., a recess was taken until 2:00 p.m., the same day.)

## AFTERNOON SESSION

2:00 P.M.

MR. GRAY: Shall we resume?

MR. MARKS: It is agreeable to Dr. Oppenheimer that the proceedings continue this afternoon without his presence.

MR. GRAY: I just want to make it clear that it is a matter of his own choosing, and not of Mr. Garrison, that they are not present this afternoon for the remainder of these proceedings.

MR. MARKS: That is correct. He may be back before we finish, but this is a matter of his own choosing.

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

## CROSS EXAMINATION

BY MR. ROBB:

Q Dr. Rabi, you testified that in the fall of 1949, the problem of the Super program had your attention quite considerably.

A Yes.

Q And I believe you said that you talked with Dr. Lawrence and Dr. Alvarez about it.

A Yes.

Q Could that have been in October, just before the meeting of the GAC.

(Dr. Oppenheimer entered the room.)

MR. GRAY: You are back now, Dr. Oppenheimer.

DR. OPPENHEIMER: This is one of the few things I am really sure of.

THE WITNESS: I can't remember the exact date. I think it was in the fall. It was before the GAC meeting.

BY MR. ROBB:

Q It was before the GAC meeting?

A I am quite sure.

Q Did Dr. Alvarez and Dr. Lawrence come to see you in New York?

A That is right.

Q Together or did they come separately?

A Together.

Q What was the purpose of their visit to you, sir?

A Well, we are old friends. I don't remember what the purpose was that they wanted to come up which I didn't find extraordinary. Physicists visit one another. Both are people I have known for a long time. But we did talk on this thing which was in our mind.

Q Yes. To save time, didn't they come to see you with special reference to the thermonuclear question or the Super question?

A That may have been in their minds. It may have been in their minds. We got going on it right away.

Q In all events, you talked about it?

A That is right. What was in their minds, I don't know.

Q Do you recall what their views were on it as they expressed them to you then?

A Their views were that they were extremely optimistic. They are both very optimistic gentlemen. They were extremely optimistic about it. They had been to Los Alamos and talked to Dr. Teller, who gave them a very optimistic estimate about the thing and about the kind of special materials which would be required. So they were all keyed up to go bang into it.

Q They thought we ought to go ahead with it?

A I think if they had known then what we knew a year later, I don't think they would have been so eager. But at that time they had a very optimistic estimate.

Q To help you fix the time, was that after the Russian explosion?

A After the Russian explosion.

Q Was that the main reason why they thought we ought to get along with the thermonuclear program?

A I don't know.

Q Beg pardon?

A I would suppose so. As I testified before, what I testified was that we felt we had to do something to recover our lead.

Q Did you express your view to them on that subject?

A Yes, that we had to do something, and I think that I may have inclined -- this is something which I kept no notes

and so on.

Q I understand, Doctor.

A I think I may have inclined toward their view on the basis of the information they said they had from Dr. Teller.

Q Did you find yourself in any substantial disagreement with their views as they expressed them then?

A It wasn't the case of agreement or disagreement. I generally find myself when I talk with these two gentlemen in a very uncomfortable position. I like to be an enthusiast. I love it. But those fellows are so enthusiastic that I have to be a conservative. So it always puts me in an odd position to say, "Now, no. There, there," and that sort of thing. So I was not in agreement in the sense that I felt they were as usual, which is to their credit -- they have accomplished very great things -- overly optimistic.

Q Except for that you agreed with their thought that we ought to do something, as you put it, to regain our position?

A That is right. I felt very strongly. I spoke to everybody I could properly speak to, as I said earlier, talking about what we could do to get back this enormous lead which we had at that time. This of course was one of the possibilities.

Q Was it before that or after that you talked to Dr. Oppenheimer?

A I really don't remember the sequence of events at

that time and when I saw Dr. Oppenheimer, whether he was away for the summer or I was, or what, I wish I could testify.

I don't keep a diary.

Q I understand. All I want is your best recollection, Doctor. Whenever you talked to Dr. Oppenheimer, did he express his views on this matter?

A It is very hard to answer. I just don't recollect to tell you a specific time at a specific place where I spoke to Oppenheimer.

Q May I help you a little bit? It is difficult to separate what he might have told you before the meeting with what he said at the meeting.

A To which meeting are you talking?

Q The meeting of October 29.

A I don't really remember that we met before the meeting or immediately before the meeting, or that he told me something of that sort. I just don't remember. My actual recollection is that I learned the purpose of the meeting at the meeting, but I am not certain. I just can't tell.

Q At all events, the views expressed by Dr. Oppenheimer at the meeting were not in accord with those expressed to you by Alvarez and Lawrence, were they?

A No, the meeting was a very interesting one. It was a rather solemn meeting. I must say that Dr. Oppenheimer as Chairman of the meeting always conducted himself in such a

way as to elicit the opinions of the members and to stimulate the discussion. He is not one of these chairmen who sort of takes it their privilege to hold the floor; the very opposite. Generally he might express his own view last and very rarely in a strong fashion, but generally with considerable reservations. When he reported to the Commission, it was always a miracle to the other members on the committee how he could summarize three days of discussions and give the proper weight to the opinion of every member, the proper shade, and it rarely happened that some member would speak up and say, "This isn't exactly what I meant." It was a rather miraculous performance.

Q Doctor, as Chairman of the GAC, do you have custody of the minutes of the GAC?

A In what sense do you mean, sir? Do I possess them in my office in New York?

Q Yes, sir.

A No, sir.

Q Where would those be?

A In the AEC building in our office.

Q In all events there were no minutes of this October 29th meeting?

A I don't think there were minutes. There was a report.

Q Yes.

A When we got down to a sort of settled procedure, we had the minutes. But at the end of the meeting there was a

verbal report from the Chairman GAC to the Chairman AEC and then a written report summarizing certain conclusions and recommendations, and if there were differences of opinion, trying to give the proper shade and tone, telling the date of the next meeting, and if we know, the kind of questions we would like to take up at the next meeting.

Q Do you recall any mention at that meeting of October 29, 1949, of a communication from Dr. Seaborg about the problem under discussion?

A I can't recollect. I don't know. I might add it would not have been very significant, because my feeling is now that we came into the meeting without any clear ideas, that in the course of an extremely exhausting discussion to and fro, examining all the possibilities we each became clearer as to what this thing meant. So anybody who didn't participate in the discussion wouldn't have gotten what we conceived at that time to be that kind of clarity.

Q You said somebody from the Joint Chiefs came to talk to you. Do you remember who that was?

A As I remember it, I think it was General Bradley.

Q You said your impression was that General Bradley was not very well briefed.

A On atomic energy, that is right.

Q Doctor, whose business was it to brief General Bradley, anyway?

A I suppose the Military Liaison Committee.

Q I see. You mean between the AEC and the Joint Chiefs?

A Yes, that is the way of communication, I presume.

Q Who was on that committee?

A That is a matter of record. I am sorry, I can't remember who happened to be the chairman. The military personnel changed all the time. The chairman changed all the time. For the life of me, I can't remember at present who it was then.

Q I have a note here and I think I wrote down your exact language: "If they had been well briefed, we would have been where we are now three or four years ago." Could you explain that to us?

A Sure. If they had been well briefed and understood what atomic weapons meant in the whole thing, the sort of thing that the new look is talking about, we would have put up the kind of factories which we have at Paducah and we are setting up in Iowa and at Savannah River, and the increase in facilities in Hanford and so on, and we would have gone to town and spent the kind of money earlier that we spent later. That is what I mean.

MR. GRAY: Just at that point, you mean with respect to A bombs, if I can refer to it that way?

THE WITNESS: The materials are similar.

MR. GRAY: So you had in mind also the thermonuclear?

THE WITNESS: Yes, sir, everything. You can design so that the materials which enter are more or less interchangeable. You can do that with that in mind. In fact, that is what was done.

MR. ROLANDER: For clarity, you said Iowa; did you mean Ohio?

THE WITNESS: I meant Ohio. Thank you. Portsmouth.

BY MR. ROBB:

Q You spoke of a meeting at Princeton in 1951, is that right?

A Yes.

Q That was after Dr. Teller's discovery, if we may call it such, wasn't it?

A At that point I wouldn't call it Dr. Teller's discovery. I think Dr. Teller had a very important part in it, but I would not make a personal attribution.

Q I was not trying to decide that, but merely to identify it. It was after some discovery was made which was extremely promising.

A Not discovery; invention.

Q Invention, yes, sir. Was there any discussion at that meeting as to whether or not the President's directive to proceed with the thermonuclear permitted you to go ahead with the development of that invention? Do I make myself clear?

A No.

Q Was there any discussion about whether or not you could go ahead with the work on that invention, with the exploitation and development of it in the terms of the President's orders or directive?

A The only discussion, as I recall, sir, were the ways and means of going ahead, and how to get certain questions settled. There were certain technical questions of what would happen under certain circumstances in this design. It was amenable to theoretical calculations by some very good man, I think Dr. Bethe went and did it.

Q But there was no discussion about whether or not the terms of the President's directive permitted you to go to work on that invention?

A No, I don't recall any. It would be hard for me to see why there should have been.

Q Doctor, I notice this sentence in the report of the GAC of the October 29, 1949, meeting, which I am told I may read aloud:

"It is the opinion of the majority that the Super program itself should not be undertaken and that the Commission and its contractors understand that construction of neutron producing reactors is not intended as a step in the Super program."

Q Doctor, were the neutron producing reactors to which you had reference there the same type that were constructed

at Savannah?

A Yes, sir. They were constructed with that in mind. They were dual purpose. The design could be optimized in one direction or another direction and a balance was made, as I remember.

Q Is it appropriate to ask the Doctor when they were constructed?

DR. BECKERLEY: I think that is a matter of public record.

THE WITNESS: It is a matter of record, and I would not try to test my memory on that.

BY MR. ROBB:

Q In all events, when they were constructed, they were constructed with a view that they would be a step in the Super program?

A That they could be a step in the Super program. We were in a wonderful position, we could go one way or the other.

Q Doctor, you said that the Chairman of the Atomic Energy Commission, Jr. Strauss, in January of this year had asked you to take a look at the FBI report which he had on Dr. Oppenheimer.

A Yes.

Q Did you mean to say by that that he asked you to come to his office for that purpose?

A We talked about the case, of course. He informed me

of the thing.

Q Yes.

A He thought as Chairman of the General Advisory Committee I ought to know the contents of that report. I think if I had asked for the full report, I would have gotten it. I may say that that record is not something I wanted to see.

Q No, I understand that.

A In fact, I disliked the idea extremely of delving into the private affairs in this way of a friend of mine, but I was finally convinced that it was my duty to do so.

Q Certainly. What I had in mind, Doctor, was that you did not mean to suggest that Mr. Strauss sent for you and said to you in effect, "Look what I have now."

A Oh, no.

Q I was sure of that.

A No.

Q Did you go to see him on that occasion on your own volition or did he send for you?

A I go see him every time I am in Washington and spend an hour or two with him discussing all sorts of problems which refer to the GAC, AEC relations. I am going to see him this afternoon if I get away from here in time.

Q Certainly, Doctor, don't answer this question unless you want to, but did you go to see Mr. Strauss on one occasion more or less in behalf of Dr. Oppenheimer?

A Just especially for that purpose?

Q Well, among other purposes. You may have had other purposes.

A We have talked about this every time I met him.

Q Yes, I can quite understand that.

A Yes. I have talked to Mr. Strauss on this certainly in behalf of Dr. Oppenheimer, but even more in behalf of the security of the United States. To tell you frankly, I have very grave misgivings as to the nature of this charge, still have, and the general public discussion which it has aroused, and the fear that as a result of such a discussion important security information absolutely vital to the United States may bit by bit inadvertently leak out. I am very much worried about that.

Q Doctor, do you approve of Dr. Oppenheimer's course of giving the letter from General Nichols and his reply to the newspapers?

A I don't know his motives on that. In his position, I think I would have done the same thing.

Q I just wanted to get your views on it.

A Yes.

Q You said, sir, that you would rather not answer with respect to the matter of continental defense?

A No, I did not.

Q May I finish my question? As to the difference in

emphasis between you and Dr. Oppenheimer?

A No, sir, I don't recall I said that.

Q I misunderstood you.

A It was a possible difference in emphasis of the method of employment of a strategic air force.

Q I see. That is what I was trying to say.

A In the method of employment. In other words, this is a kind of military question and runs into problems of target selection, things of that sort. For that reason, since this is not just an AEC question for which I understand the members of this panel are cleared, but refers to DOD questions, I would rather not talk about it.

Q In other words, you feel that would be classified information which you should not disclose even to the members of this Board?

A That is right. I don't want to skirt around and maybe fall into something.

MR. ROBB: I see. I think that is all I would like to ask, Mr. Chairman.

MR. GRAY: Doctor Rabi, you mentioned this morning that at the October 1949 meeting of the GAC, General Bradley came, to the best of your recollection, and you said also there was a State Department man. Do you remember who that was?

THE WITNESS: I think it was Mr. Kennan.

MR. GRAY: You mentioned a meeting at Los Alamos in

the summer, I believe, of 1950?

THE WITNESS: Yes.

DR. GRAY: That was before the Princeton meeting, of course, to which you referred?

THE WITNESS: Yes.

DR. GRAY: Was Dr. Oppenheimer at the meeting in the summer of 1950?

THE WITNESS: Yes, indeed. I don't remember exactly. The meeting, I think, was a meeting of the Subcommittee on Weapons. I think there were three subcommittees of the General Advisory Committee which were sort of specialized, one weapons, one on reactor and one on research. I think that was the Weapons Subcommittee. I don't recall the full attendance at that meeting, but Dr. Oppenheimer was there.

DR. GRAY: With respect to the development of the H bomb -- I don't know how to refer to it exactly, but you know what I am talking about -- and the issue of who was for and who was against, was it your impression that Dr. Oppenheimer was unalterably opposed to the development?

THE WITNESS: No, I would not say so, because after we had those two statements, which were written by different groups which were put in, I distinctly remember Dr. Oppenheimer saying he would be willing to sign both.

MR. GRAY: My question was bad, because "unalterably" is a pretty strong word, and you have already testified that

subsequent to the President's decision he encouraged the program and assisted in it.

THE WITNESS: Yes, sir.

MR. GRAY: So I think this was a bad question.

THE WITNESS: I was really testifying as to that time, that there were two statements of attitudes which differed, and he said he would be ready to sign either or both.

MR. GRAY: He would have been willing to sign the one which you signed?

THE WITNESS: That Fermi and I did, yes.

MR. GRAY: Would you have considered those two reports absolutely consistent?

THE WITNESS: No.

MR. GRAY: Yourself?

THE WITNESS: No. I just answered your question about being unalterably opposed.

MR. GRAY: There was a real difference?

THE WITNESS: Yes, sir, there was a real difference. There was no difference as far as a crash program was concerned. That they thought was not in order.

MR. GRAY: I have one other question. You testified very clearly, I think, as to your judgment of Dr. Oppenheimer as a man, referring to his character, his loyalty to the United States, and to his friends and to institutions with which he might be identified, and made an observation about

associations.

As of today would you expect Dr. Oppenheimer's loyalty to the country to take precedence over loyalty to an individual or to some other institution?

THE WITNESS: I just don't think that anything is higher in his mind or heart than loyalty to his country. This sort of desire to see it grow and develop. I might amplify my other statement in this respect, and that is something we talked of through the years. When we first met in 1929, American physics was not really very much, certainly not consonant with the great size and wealth of the country. We were very much concerned with raising the level of American physics. We were sick and tired of going to Europe as learners. We wanted to be independent. I must say I think that our generation, Dr. Oppenheimer's and my other friend that I can mention, did that job, and that ten years later we were at the top of the heap, and it wasn't just because certain refugees came out of Germany, but because of what we did here. This was a conscious motivation. Oppenheimer set up this school of theoretical physics which was a tremendous contribution. In fact, I don't know how we could have carried out the scientific part of the war without the contributions of the people who worked with Oppenheimer. They made their contributions very willingly and very enthusiastically and singlemindedly.

MR. GRAY: Perhaps I could get at my question this way.

You are familiar, if you have read the Nichols letter and read the summary of a file which Chairman Strauss handed you, with the Chevalier episode to some extent, I take it.

THE WITNESS: I know of the episode, yes.

MR. GRAY: Would you expect Dr. Oppenheimer today to follow the course of action he followed at that time in 1943?

THE WITNESS: You mean refuse to give information? Is that what you mean?

MR. GRAY: Yes.

THE WITNESS: I certainly do. At the present time I think he would clamp him into jail if he asked such a question.

MR. GRAY: I am sorry.

THE WITNESS: At the present time if a man came to him with a proposal like that, he would see that he goes to jail. At least that is my opinion of what he would do in answer to this hypothetical question.

MR. GRAY: Do you feel that security is relative, that something that was all right in 1943, would not be all right in 1954?

THE WITNESS: If a man in 1954 came with such a proposal, my God -- it would be horrifying.

MR. GRAY: Supposing a man came to you in 1943.

THE WITNESS: I would have thrown him out.

MR. GRAY: Would you have done anything more about it?

THE WITNESS: I don't think so. Unless I thought he was just a poor jackass and didn't know what he was doing. But I would try to find out what motivated him and what was behind it, and get after that at any time. If somebody asked me to violate a law and an oath --

MR. GRAY: I hope you are not taking offense at my asking this question, but this is a perfectly serious question because you have testified without equivocation, I think, and in the highest possible terms of Dr. Oppenheimer's character, his loyalty, and with certain reservations about his early associations. As Mr. Marks pointed out in the question leading to this testimony, these are things which the Atomic Energy Act says must be taken into account in this matter of clearance. I trust you understand this is a very solemn duty that this Board has been given.

THE WITNESS: I certainly do, sir.

MR. GRAY: There have been those who have testified that men of character and standing and loyalty that this episode should simply be disregarded. I don't think that is an unfair summary of what some of the witnesses have said. Do you feel that this is just a matter that is of no consequence?

THE WITNESS: I do not think any of it is of no consequence. I think you have to take the matter in its whole context, For example, there are men of unquestioned loyalty

who do not know enough of the subject -- I am taking now of the atomic energy field -- so that in their ordinary speech they don't know what they are saying. They might give away very important things.

MR. GRAY: That would be true of me, I am sure.

THE WITNESS: It certainly has been true of a lot of military stuff that you see published. It makes your hair stand on end to see high officers say, and people in Congress say some of the things they say. But with a man of Dr. Oppenheimer's knowledge, who knows the thing completely, and its implications and its importance, and the different phases, believing as I do in his fundamental loyalty, I think to whom-ever he talked he would know how to stay completely clear of sensitive information.

MR. GRAY: In any event, I suppose --

THE WITNESS: I think there is a very large distinction there.

MR. GRAY: In any event, I believe you did testify that you would be quite convinced -- I am not sure you did -- are you quite convinced that as of today Dr. Oppenheimer's course of action would be in accord with what you would do, rather than what he did in respect to the matter of this sort. I can't say what a man will do, but we only can apply subjective tests in these matters as far as your testimony as to character, loyalty and so forth, are concerned. So this

is all subjective, but would you expect without any real question in your mind that today Dr. Oppenheimer would follow the kind of course that you would approve of today with respect to this matter?

THE WITNESS: I think I can say that with certainty. I think there is no question in my mind of his loyalty in that way. You know there always is a problem of that sort. I mean the world has been divided into sheep and goats. I mean the country has been divided into sheep and goats. There are the people who are cleared and those who are not cleared. The people against whom there has been some derogatory information and whatnot. What it may mean and so on is difficult. It is really a question in one's personal life, should you refuse to enter a room in which a person is present against whom there is derogatory information. Of course, if you are extremely prudent and want your life circumscribed that way, no question would ever arise. If you feel that you want to live a more normal life and have confidence in your own integrity and in your record for integrity, then you might act more freely, but which could be criticized, either for being foolhardy or even worse.

In one's normal course at a university, one does come across people who have been denied clearance. Should you never sit down and discuss scientific matters with them, although they have very interesting scientific things to say?

MR. GRAY: No, I would not think so.

THE WITNESS: That is the sort of question you are putting, Dr. Gray, and I am answering to the best of my ability.

MR. GRAY: I am wondering whether it is, Dr. Rabi. Let me say this. I think there is not anybody who is prepared to testify that he can spot a Communist with complete infallibility. I know that there have been people who surprised me that I had an acquaintanceship with who turned out to be Communists. I don't think it is unfair to say that witnesses including Dr. Oppenheimer himself have testified that there were people who later turned out to be Communists, to their surprise, who they identified.

I am asking against the background of the security of this country which must be paramount, it seems to me, perhaps unhappily, to any other consideration or personal institution, can we afford to make it a matter of individual judgment as to whether a person is dangerous, in this case Mr. Chevalier. I don't know that he has ever appeared before any committee or anything else. I don't know whether he is a member of the Communist Party or not. It is conceivable that he might have been. I am afraid I am making an argument now, but it is all a part of this question. Against what I believe to be the commitments involved in joining the Communist Party, can it be a matter of individual judgment whether it does no harm to either fail to report what seems to be an espionage

attempt or to discuss in however clear terms information which is of a classified nature. That is the most confused question you ever had put to you, and I think I should eliminate the last part in any event, because the Chevalier incident did not, as I understand it, involve disclosure of information. There was none of that involved. I don't want the record to make it appear that I am implying that. This was simply a question of not taking immediate security precautions either in respect to reporting the incident, a later matter of declining to disclose the name of the man who made the approach and certain other less than frank aspects. I believe you said you did not think that was a proper course to follow, and you would expect Dr. Oppenheimer to follow a different course today.

THE WITNESS: Yes.

MR. GRAY: Which implies, certainly, I think that you think he should follow a different course today.

THE WITNESS: I can't say anything but yes. We have all learned a whole lot since that time. A lot of things which were quite different at one time but different in another. You have to become accustomed to life in this kind of life when you are involved in this kind of information.

MR. GRAY: You are saying that in your judgment Dr. Oppenheimer has changed?

THE WITNESS: He has learned.

MR. GRAY: All right.

THE WITNESS: I think he was always a loyal American. There was no doubt in my mind as to that. But he has learned more the way you have to live in the world as it is now. We hope at some future time that the carefree prewar days will return.

DR. EVANS: Dr. Rabi, would you tell us something about your early education?

THE WITNESS: I am a graduate of Manual Training High School in Brooklyn, a graduate of Cornell University with a degree of bachelor of chemistry -- we are fellow chemists.

DR. EVANS: I am glad you had some chemistry.

THE WITNESS: I had an awful lot of chemistry. Then I worked after that for a year in analytical laboratories, the Pease Laboratory, which were an affiliate of the Lederle Laboratories in New York, and then for various things for a few years. I went back to Cornell, I think it was in 1923, for graduate work in chemistry, but during the course of setting up my program, I decided to change to physics. I spent a year at Cornell in graduate work and then went to Columbia where I transferred, where I took my doctor's degree in 1927. I am older than Dr. Oppenheimer, but his degree, I think, is older than mine, or about the same vintage.

During that period I supported myself by instructing in physics at the College of the City of New York. Then I got a fellowship from Columbia, and went to Europe to study

theoretical physics, first at Munich and then to Copenhagen, and then to Hamburg.

While there I had an idea for an experimental problem and changed back to doing experimental physics. After my experiment was done, I went to Leipzig with Professor Heisenberg back to theoretical physics, where I first met Dr. Oppenheimer briefly on his visit, and after Dr. Heisenberg went to the United States for a lecture tour, I went to Zurich, where Dr. Oppenheimer was working on Stellar, and we found ourselves sympathetic.

At the end of that summer I went to Columbia as a lecturer in physics. I have been at Columbia ever since, except for a five year period during the war. I enlisted - enlisted is the wrong word -- I left Columbia in November 1940 to join the Radiation Lab at MIT, which was concerned with the production of microwave radar, the research and development of microwave radar, and stayed there throughout the war.

My connection with Los Alamos, I was never on their payroll, but went there as a radiation lab man.

DR. EVANS: Let me ask you another question that has nothing particularly pertinent to this proceeding. Is George Pegram still active?

THE WITNESS: Wonderfully. He is doing two men's work. He is 78, you know. Recently he has had a heart attack. He is chairman of a committee which handles all the research

contracts which amount to many, many millions for the university.

MR. GRAY: I think the record will have to show that he is a native North Carolinian.

THE WITNESS: Yes, sir, a graduate of Trinity College. His father was professor of chemistry.

DR. EVANS: I wish you would tell him that Dr. Evans asked about him.

THE WITNESS: I would be delighted to.

DR. EVANS: Now, another question. Were you as a scientific man particularly surprised when you heard that the Russians had fired a bomb, or would you have expected it?

THE WITNESS: I was astonished that it came that soon. I will tell you this was a peculiar kind of psychology. If you had asked anybody in 1944 or 1945 when would the Russians have it, it would have been five years. But every year that went by you kept on saying five years. So although I was certain they would get it --

DR. EVANS: You were certain they would get it?

THE WITNESS: I was certain that they would get it, but it was a stunning shock.

DR. EVANS: You would be pretty certain right now that they will get the thermonuclear?

THE WITNESS: In time. What I am afraid of is this controversy over this case may hasten the day because of the sort of attrition of the security of technical information, all

sorts of stuff appearing in the newspapers and magazines and so on that sort of skirts around it. You know you have a filter system for information. You put bits and pieces together. They already know something. If Fuchs transmitted the information they have essentially the object which we were talking about in 1949. So they have a start, and if they can reconstruct our line of thinking, it is almost inevitable they will get it. I don't mind telling you gentlemen I am very, very deeply concerned.

DR. EVANS: You understand, of course, our position on this Board, do you not?

THE WITNESS: Yes, it is not your problem, but I think it is the problem of the Government of the United States.

DR. EVANS: Did you know that some of the people that were educated with Dr. Oppenheimer, listened to his lectures, and turned out to be Communists?

THE WITNESS: Educated with him?

DR. EVANS: It was in that school that he conducted--

THE WITNESS: You mean who studied with him?

DR. EVANS: Yes.

THE WITNESS: I have heard that, but I can't -- this is not direct information.

DR. EVANS: You have met some Communists, have you, Dr. Rabi?

THE WITNESS: I have met people who later said they were Communists. At Los Alamos I met Mr. Hawkins, who said he had been a Communist, and this other chap, what is the name, I can't remember at this moment. I certainly knew Frank Oppenheimer from the time he was a kid in high school.

DR. EVANS: You didn't meet any of those at the Radiation Laboratory like Bernie Peters?

THE WITNESS: I met Peters just fleetingly once or twice. I don't recall any actual conversations with Peters.

DR. EVANS: Dr. Rabi, if you were approached by someone attempting to secure from you security information, would you report it immediately, or would you consider it for quite a long time?

THE WITNESS: Are you talking about April 21, 1954?

DR. EVANS: Oh, no.

THE WITNESS: What date are you talking about?

DR. EVANS: I am talking about the Chevalier incident. What date was that?

MR. ROBB: Late 1942 or early 1943.

THE WITNESS: I would like to have the question, since this is a crucial question, put more fully so that I can answer the point rather than make up the question, so to speak.

DR. EVANS: You are giving me a big job, aren't you?

THE WITNESS: This is not child's play here.

DR. EVANS: If you had been working on security

material, material that had a high priority, and someone came to you and told you that they had a way of getting that material to the Russians, what would you have done immediately?

THE WITNESS: You mean if it was just someone that I didn't know?

DR. EVANS: No, someone that you knew. Suppose I was a friend of yours and I came and told you.

THE WITNESS: And I thought that you were a completely innocent party or not? I think that is the nub of the question, what I would have done at that time. I can't say what I would have done at that time. I kind of think I would have gone after it and found out just what this was about.

DR. EVANS: That is all.

#### REDIRECT EXAMINATION

BY MR. MARKS:

Q Dr. Rabi, what do you mean you would have gone after it and found out what this was about?

A I would have tried to see that the proper authorities found out what these people meant to do, what the thing was. I know a number of times during the war I heard funny noises in my telephone and got the security officers after it.

Q Dr. Rabi, Mr. Robb asked you whether you had spoken to Chairman Strauss in behalf of Dr. Oppenheimer. Did you mean to suggest in your reply -- in your reply to him you said you did among other things -- did you mean to suggest that you

had done that at Dr. Oppenheimer's instigation?

A No, I had no communication from Dr. Oppenheimer before these charges were filed, or since, except that I called him once to just say that I believed in him, with no further discussion.

Another time I called on him and his attorney at the suggestion of Mr. Strauss. I never hid my opinion from Mr. Strauss that I thought that this whole proceeding was a most unfortunate one.

DR. EVANS: What was that?

THE WITNESS: That the suspension of the clearance of Dr. Oppenheimer was a very unfortunate thing and should not have been done. In other words, there he was; he is a consultant, and if you don't want to consult the guy, you don't consult him, period. Why you have to then proceed to suspend clearance and go through all this sort of thing, he is only there when called, and that is all there was to it. So it didn't seem to me the sort of thing that called for this kind of proceeding at all against a man who had accomplished what Dr. Oppenheimer has accomplished. There is a real positive record, the way I expressed it to a friend of mine. We have an A bomb and a whole series of it, and we have a whole series of Super bombs and what more do you want, mermaids? This is just a tremendous achievement. If the end of that road is this kind of hearing, which can't help but be

humiliating, I thought it was a pretty bad show. I still think so.

BY MR. MARKS:

Q Dr. Rabi, in response to a question of the Chairman, the substance of which I believe was, was Dr. Oppenheimer unalterably opposed to the H bomb development at the time of the October 1949 SAC meeting, I think you said in substance no, and then you added by way of explanation immediately after the two annexes or whatever they were --

A During the discussion.

Q During the discussion he said he would be willing to sign either or both. Can you explain what you meant by that rather paradoxical statement?

A No, I was just reporting a recollection.

Q What impression did you have?

A What it means to me is that he was not unalterably opposed, but on sum, adding up everything, he thought it would have been a mistake at that time to proceed with a crash program with all that entailed with this object that we didn't understand, when we had an awfully good program on hand in the fission field, which we did not wish to jeopardize. At least we did not feel it should be jeopardized. It turned out in the events that both could be done. Los Alamos just simply rose to the occasion and worked miracles, absolute miracles.

MR. MARKS: That is all.

## RE CROSS EXAMINATION

BY MR. ROBB:

Q Doctor, on the occasion when you were in Mr. Strauss' office, and he showed you the report that you testified about, how long would you say that meeting lasted?

A I can't remember.

Q A few minutes?

A I don't know whether it was a few minutes or half an hour. If you were Mr. Strauss, there are calls coming in all the time from all over, from the White House, and what not.

Q Did you look at the report in Mr. Strauss' office?

A No. I put it in an envelope and went to our GAC office. I read it there, and then brought it back.

Q Dr. Rabi, getting back to the hypothetical questions that have been put to you by the Chairman and Dr. Evans about the Chevalier incident, if you had been put in that hypothetical position and had reported the matter to an intelligence officer, you of course would have told the whole truth about it, wouldn't you?

A I am naturally a truthful person.

Q You would not have lied about it?

A I am telling you what I think now. The Lord alone knows what I would have done at that time. This is what I think now.

Q Of course, Doctor, as you say, only God knows what

is in a man's mind and heart, but give us your best judgment of what you would do.

A This is what I think now I hope that is what I would have done then. In other words, I do not -- I take a serious view of that -- I think it is crucial.

Q You say what?

A I take a serious view of that incident, but I don't think it is crucial.

Q Of course, Doctor, you don't know what Dr. Oppenheimer's testimony before this Board about that incident may have been, do you?

A No.

Q So perhaps in respect of passing judgment on that incident, the Board may be in a better position to judge than you?

A I have the highest respect for the Board. I am not going to make any comment about the Board. They are working very hard, as I have seen.

Q Of course, I realize you have complete confidence in the Board. But my point is that perhaps the Board may be in possession of information which is not now available to you about the incident.

A It may be. On the other hand, I am in possession of a long experience with this man, going back to 1929, which is 25 years, and there is a kind of seat of the pants feeling which

I myself lay great weight. In other words, I might even venture to differ from the judgment of the Board without impugning their integrity at all.

Q I am confining my question to that one incident, Doctor. I think we have agreed that the Board may be in possession of information from Dr. Oppenheimer's own lips about that incident which is not now available to you, is that correct?

A This is a statement?

Q Yes.

A I accept your statement.

Q And therefore it may well be that the Board is now in a better position than you, so far as that incident is concerned, to evaluate it?

A An incident of that sort they may be. I can't say they are not. But on the other hand, I think that any incident in a man's line of something of that sort you have to take it in sum.

Q Of course.

A You have to take the whole story.

Q Of course.

A That is what novels are about. There is a dramatic moment and the history of the man, what made him act, what he did and what sort of person he was. That is what you are really doing here. You are writing a man's life.

Q Of course, but as a scientist, Doctor, and

evaluating, we will say, an explosion you perhaps would be in a better position to evaluate an explosion having witnessed it and having first hand knowledge about it than somebody who had not, is that right?

A If you put it in that way, I don't know the trend of your question. I am not fencing with you. I really want to know what you are getting at.

Q I am not fencing with you either.

A If you are saying that an eye witness to something can give a better account of it than a historian, that I don't know. Historians would deny it. It is a semantic question, but if you want to be specific about it --

Q I will put it this way. As a scientist, you would say that one having all the facts about a particular physical manifestation or reaction would be in a better position to evaluate that than somebody who did not have all of the facts or might not know one of the facts?

A A lot of the things about this are not the sort of things which you term just facts. We have Mr. Morgan here, for example, who has been the head of a big business which he built up. He gets as many facts as possible, but I am sure beyond that there is a lot of experience and color which make his judgment. In a court of law it might be something else. Ultimately you go to a jury who have facts, and then they add a whole lot of things which your heart identifies as facts

and their experience in life to a situation. I was afraid your question was tending to put me in the position of a so-called fiction scientist who looks at certain facts and measurements, and we are not talking about such a situation.

Q Let me get back again to the concrete. Would you agree, Doctor, that in evaluating the Chevalier incident one should consider what Dr. Oppenheimer says happened in that incident, together with the testimony of persons such as yourself?

A Wait a minute. I didn't testify to that incident because I have only heard about it.

Q Together with testimony of persons such as yourself about Dr. Oppenheimer.

A Yes, that is right.

Q Very well; therefore, one who had heard Dr. Oppenheimer describe the incident and had heard your testimony would be in a better position to evaluate it than one who had not heard Dr. Oppenheimer describe it, is that correct?

A I will put it this way. I think this committee is going into this and they will be in as good a position as it is humanly possible to be for people who have never met this man before to make a judgment about it. I certainly reserve the right to my own opinion on this, because I am in the possession of a long period of association, with all sorts of minute reactions. I have seen his mind work. I have seen

his sentiments develop. For example, I have seen in the last few years something which surprised me, a certain tendency of Dr. Oppenheimer to be inclined toward a preventive war. Nothing went all the way. But talking and thinking about it quite seriously. I have to add everything of that sort. All sorts of color and form my own opinion. But I am not on this Board, and I think this Board is trying to do what it can in this business of getting testimony, the kind of people to come talk to them, the evaluation of the people and the kind of insight, whether they are just loyal people or whether they have thought about the problem, and so on. It is a tough job. But nevertheless, I say I will still stick to my right to have my own opinion.

Q Certainly, Doctor. To sum up, I suggest to you what I did to Dr. Conant, and he agreed, that in deciding about a matter such as the Chevalier incident, one must consider all the available relevant evidence, is that right?

A Certainly.

Q And that would include what actually happened and what people such as yourself, who know Dr. Oppenheimer, say about Dr. Oppenheimer.

A You are talking about the job of the committee; yes.

Q Yes.

MR. ROBB: Thank you, Doctor.

MR. GRAY: Do you have any more questions?

MR. MARKS: I think I better ask one more question, if the Board will indulge me.

REDIRECT EXAMINATION

BY MR. MARKS:

Q Dr. Rabi, in view of the quite serious questions which quite properly have been asked you in regard to this so-called Chevalier episode, I would like to try to summarize for you what I understand the testimony to be, and ask you how that would affect the opinions you have expressed.

As I understand the testimony, it is that Chevalier who was an old friend of Dr. Oppenheimer, a member of the faculty in Romance Languages at the University of California, was at his house on an occasion in the early part of 1943, and at that time Dr. Oppenheimer found himself at one point in the visit alone with Dr. Chevalier, who said that he understood from Eltenton that Eltenton had a way of getting information to the Russians. I think it is fair to say that the testimony is that Oppenheimer reacted emphatically in rejecting as wrong any consideration of such a matter, and used very strong language to Chevalier, and that Oppenheimer was thereafter convinced that Chevalier had entirely dropped the matter.

Some months later after Los Alamos had been set up and Oppenheimer was there as director, the security officer, Lansdale, mentioned to Oppenheimer that there was trouble of some kind at Berkeley. The indication was that some of the

young physicists had committed indiscretions

On the occasion of Dr. Oppenheimer's next visit to Berkeley he sought out the security officers there, told them that he understood that there was trouble of some kind, said that he thought that a man Eltenton would bear watching.

The next day the security officers asked Oppenheimer to talk to them further about the incident. At that time they asked him to explain the circumstances which had moved him to suggest the name Eltenton. Dr. Oppenheimer said that there had been an intermediary.

The security officers asked him to name the intermediary. He declined to do so. The security officers asked him whom the intermediary had approached. Oppenheimer said people on the project, and in the course of a long interview it appears that they suggested there were two or three such people. He did not name himself or Chevalier as the people concerned.

In the course of a long conversation at that time with the security officers, he mentioned also that a man at the Soviet consulate was involved, and there was some reference to microfilm, although the transcript of the conference between Oppenheimer and the security officers is not clear as to the context in which microfilms were mentioned.

Later Colonel Lansdale, a few weeks later, again interviewed Oppenheimer and asked him to name the intermediary.

Oppenheimer again declined, and on all of these occasions he gave as his explanation that he didn't want people to get in trouble who had acted properly and innocently, that he thought he was revealing the name of the only person who could possibly be guilty of real wrongdoing.

Some time after he refused to give the true story to Lansdale or give the names to Lansdale, General Groves talked to him and asked him to name the intermediary. On that occasion Oppenheimer said, "I won't give you the names unless you order me to." Groves said, "I don't want to order you. Think about it."

Shortly after that, Groves again came to Oppenheimer and said, "I need to have the name. If you don't give it to me, I will have to order you to," and at that time Oppenheimer gave the name of Chevalier as the intermediary.

In the course of questioning Dr. Oppenheimer about these circumstances, counsel for the Board put the question to him whether the story that he had told the security officers on the occasion of the interview that I have described at Berkeley wasn't a fabrication and a tissue of lies, and to this, I think, Oppenheimer responded, "Right".

A Right it was.

Q He accepted counsel's characterization. I may say that this occurred in the course of a very thorough cross examination.

MR. ROBB: Had you finished, Mr. Marks?

MR. MARKS: Yes.

MR. ROBB: Mr. Chairman, that was a rather long question.

MR. MARKS: I was about to ask a question.

MR. ROBB: I thought you were finished. It was a rather long statement, and I don't want the record to show that I am accepting as a completely accurate statement the entire circumstances but of course I am not going to object to it. I have not objected to any question, and I don't intend to.

MR. GRAY: Certainly it will be obvious in the record that this was stated as Mr. Marks' summary.

MR. ROBB: Yes, certainly.

MR. GRAY: On that basis he will now ask the question.

MR. ROBB: Certainly. I am sure Mr. Marks understands.

MR. MARKS: I understand perfectly.

MR. GRAY: That was not the question.

MR. MARKS: No, it wasn't. I thought Mr. Robb wished to make a correction. I understand exactly your point, Mr. Robb.

I ask you, Dr. Rabi, whether this account of my impression of the essentials of what has been brought out here leads you to wish to express any further comment?

THE WITNESS: The only comment I can make on this right off is that it is part and parcel of the kind of foolish

behavior that occurred in the early part of the record,, that there were very strong personal loyalties there, and I take it in mentioning Eltenton he felt he had discharged his full obligation. My comment is that it was a very foolish action, but I would not put a sinister implication to it. The record is full of actions before Oppenheimer became the sort of statesman he is now of that sort of thing.

BY MR. MARKS:

Q Are you confident or are you not confident, Dr. Rabi, whichever it is -- let me put it this way. Are you confident that Dr. Oppenheimer would not make the kind of mistake again?

A I certainly am. He is a man who learns with extraordinary rapidity.

Q Would you agree that incident involved a conflict in loyalties?

A The question is whether to my mind, whether it involved a conflict of loyalties within his own heart. I don't think it did in his own heart, at least from what you tell me, and taking the sum total. Apparently Chevalier was a man of whom he was very fond personally. They shared a mutual interest, I presume, of French literature. I don't think I have met the gentleman. By pointing the finger at Eltenton I think he felt that he had done the necessary thing for the protection of security. I think if he thought about it more profoundly at the time, and were not so tremendously occupied

and burdened by the Los Alamos problems, he might have been that and this was certainly something that he could not hope to keep quiet. It was a great mistake in judgment and everything else. He should have swallowed that bitter pill at once. But I read no sinister implication in it.

Q Would you be confident or would you not be confident that today he would resolve the question of his responsibility on the one hand to the country or the public in a way that you would?

A I think he would be very conscious of his position, not to impair his usefulness to the United States. Even though he might not have shared certain fears, he would not have taken that particular responsibility of withholding that information and have run that particular personal danger of doing it. I think he is just a much more mature person than he was then.

MR. MARKS: That is all.

MR. ROBB: May I ask one more question?

#### RE-CROSS EXAMINATION

BY MR. ROBB:

Q This is a purely hypothetical question, Doctor. I just want to get your reaction to it.

Suppose on all the evidence this Board should not be satisfied that Dr. Oppenheimer in his testimony here has told this Board the whole truth; what would you say then about whether or not he ought to be cleared?

A It depends on the nature of the sort of thing he withheld. There may be elements of one's private life that do not concern this Board or anybody else.

Q Suppose the Board should not be satisfied that he had told the truth or the whole truth, about some material matter; what would you say then?

A It would depend again on the nature of the material matter. If I agreed that the matter was material and germane to this, then I would be very sorry.

Q What?

A I would be very sorry.

Q You mean you would feel that they could not clear him?

A I feel it would be a very tough question.

Q Wouldn't you feel that they couldn't clear him, or would you rather not answer that?

A It is the sort of hypothetical question which to me goes under the terms of a rather meaningless question, with all due respect, in the sense that I want to know the material fact, and I would want -- the reason we don't have an individual but a board is that I would want to discuss it with others to help bring out our own feelings, and so forth.

Q Certainly.

A So therefore I feel that to answer a hypothetical question in this way without putting myself into the position as a member of the Board, and what would be the outcome of my

discussions and weighing of this thing with the other members of the Board, I think an answer to that sort of thing is something I could not give, because I haven't got the circumstances under which to answer it.

Q But the circumstances might be such --

A If you want to set me up on the Board, then I would come out with an answer.

Q No, let me ask you one more question. The circumstances might be such that you would feel that the Board should not clear him if that happened?

A There certainly are circumstances which I can picture where the Board could not clear him. You know the sort of evidence that Thoreaux refers to of finding a trout in the milk; I am pretty sure it is adultery. I am not saying there is no evidence where I would be doubtful. I would rather be more specific about it.

MR. GRAY: I am sure that Dr. Rabi understands that this Board has reached no conclusion. The Board has no view or position, and will reach none until the hearings are concluded. I am not suggesting that counsel's question was improper. I wish, however, to say for the record that it clearly is a hypothetical question.

MR. ROBB: That is why I prefaced it by saying it was hypothetical.

MR. GRAY: I know you did. I know you didn't intend

to lead Dr. Rabi to the conclusion that the Board had reached a conclusion on anything. I don't mind counsel giving their view of the testimony on either side. I do object to anything that suggests that this Board has reached any kind of conclusion.

MR. ROBB: Of course I had no such intention. That is why I prefaced my question by saying this is indeed a hypothetical question.

I think that is all, Doctor. Thank you.

MR. GRAY: We can now thank you very much, Dr. Rabi.

THE WITNESS: Thank you, sir.

(Witness excused.)

MR. GRAY: Does that conclude your witnesses for today?

MR. GARRISON: Yes.

MR. GRAY: We will recess until 9:30.

MR. GARRISON: Could we make it 10?

MR. GRAY: I would be glad to talk to the Board about it. My inclination is against it.

I am sorry. I would like to accomodate you, but the Board feels we should start at 9:30.

(Thereupon at 3:25 p.m., a recess was taken until Thursday, April 22, 1954, at 9:30 a.m.)