

The story began for me in fall of 1933. At that time I was in London and one day I read in the newspaper a report of the British Association at which Lord Rutherford spoke. Lord Rutherford said that whoever is talking about liberating atomic energy on an industrial scale is talking moonshine. Lord Rutherford was an expert. An expert may be described as a man who knows what cannot be done. The statement that something cannot be done I always found very irritating for it is an expression of a negative phase and is not capable proof. So it seems I must have asked myself could Rutherford possibly be wrong? Could there be a way to liberate atomic energy on an industrial scale? Remember that I was standing in waiting for the light to turn from red to green, it suddenly occurred to me that if we could find an element that is split by neutrons and in this process aneutrons..... and if we mixed two neutrons and they split, chain reaction might be possible. In the following next six months I was more and more obsessed by this idea. There was one element, beryllium, which was my favorite candidate and in the summer of 1934 I began to make some experiments with beryllium. Beryllium didn't do what I wanted it to do. It did something else which later on turned out to be very useful when we began to study uranium.

I foundChalmers, that if we take a block of beryllium with a hole in the middle, place radium in the hole so that the gamma rays of radium pass through the beryllium, then beryllium is disintegrated and slow neutrons. Because these neutrons are slow, this process was destined to play a major role in the story of chain reaction.

In March 1934, I applied for a patent in England.....the chain reaction. This patent was based on the hope that beryllium, or some other element, might be able to sustain a chain reaction because they emit neutrons when they are split by neutrons. This patent application contained the following passage: "Through neutron change in which the

links of the chain are formed by neutrons of the Mass No. 1 alone. Such changes are only possible in the presence of a stable element. A metastable element is an element, the mass of which is sufficiently high to allow its disintegration into parts and the liberation of energy. Elements like uranium and thorium are such metastable elements; these two elements reveal their metastable nature by emitting alpha particles. Other elements may be metastable without revealing their nature in this way."

Believing that if a chain reaction is possible atomic bombs can be made I assigned this patent to the British Admiralty in order to keep its contents secret. The arrangement was that the patent be returned to me when secrecy is no longer necessary.

Beryllium was not ~~not~~ the only element which was suspect. Suspects are also indium, bromine and uranium. In all these cases there are more radio isotopes than we could account for on the basis of when the element was bombarded by neutrons. And when was visiting in 1935, I talked to him about my suspicion and above all, the need not only to examine these elements to the possibilities of a chain reaction but also the need to keep the results ~~secret~~ secret if it should turn out that one of them is capable of sustaining a chain ~~reaction~~ reaction. Paul doubted very much that secrecy could be organized in the purely scientific field and when he returned to Denmark he wrote an article in Nature about some of the anomalies which I discussed with him in which he explicitly stated that the liberation of atomic energy on an industrial scale is impossible. Having had little success with a physicist I thought of enlisting the help of chemists because there is some such thing as a chain reaction in chemistry and therefore at least it was not unfamiliar to chemists. Therefore, I went to see Dr. Wiseman (sp?) whom I happened to know and who was one of the successful industrial chemists in England. I told Wiseman of my ideas and suggested that we set up a research project

at a cost of about £2000 and go through the table of elements, examining each element to see if it did not perchance emit neutrons when bombarded by neutrons. Weisman received the suggestion quite favorably and later on I heard that he had discussed it with ~~Michxix~~ Michael Polani, at that time the head of the Chemistry Department at the University of Manchester. Polani thought that ~~thxxx~~ the project should be set up and this was the last I heard of it. In 1946, I ran into Dr. Weisman by chance at the Wardman Park Hotel in Washington. He seemed to be very pleased to see me and asked me if I remembered the occasion when I visited him in London. I said I did and he asked me if I remembered what we discussed and I said I did. "Well," said Dr. Weisman, "perhaps you will not believe me but I tried to get those £2000 for you and found that I couldn't."

As time went on it turned out that beryllium did not ~~w~~ emit neutrons when it was split by neutrons and the anomalies observed in the case of bromine and in the case of indium, I was able to explain satisfactorily after I concluded some experiments in 1938. At this point I lost all hope that chain reaction could be set up along the lines I had envisaged, for lack of a suitable element that would emit neutrons when split by neutrons. in December 1938, I wrote a letter to the British Admiralty suggesting that the patent which dealt with ~~s~~ chain reaction be abandoned.

But before this letter reached them something happened that induced me to follow the letter with a cable asking that the letter be disregarded. What happened was as follows: In January 1939, I went to visit E. B. Wigner in Princeton who was rid of his jaundice. Wigner told me of discovery of the fission of uranium. found that when uranium was split by neutrons it disintegrated into two heavy, charged fragments. As I was listening to Wigner it suddenly occurred to me that these heavy fragments will evaporate (?) ~~nn~~ neutrons because the mass is

is large compared to the charge. Thus uranium, when split by neutrons, must emit neutrons, and at last we have an element which would be capable of sustaining a chain reaction. I told Wigner of this suspicion at once and he agreed with me that such a neutron emission of uranium was rather likely. Knowing full well ~~th~~ what this meant my first thought was to contact other physicists and to arrange with them that the neutron ~~emission~~ emission of uranium and all that follows from it shall remain unpublished, to be communicated only to friendly repositories (?). In January 1939, it was for me a foregone conclusion that Germany will go to war and that it was very important to keep the discovery from Germany. I was impatient to contact Sam (?) who was at Columbia and whom I thought might think of these possibilities independently. I intended to ~~xx~~ persuade to keep from discussing his thought with others until we are able to put our own thoughts in order and see how we want to proceed. Unfortunately, I fell ill and was for several weeks unable to contact When I was well enough I went over to Columbia University. was away but I found Rabi. Rabi told me that thought of this possibility and mentioned something at a private meeting at the Carnegie Institution of Russian (?) but that the matter was not taken very seriously. Rabi conveyed to my thoughts and tell him my reasons why I believe that this is a matter that shouldn't be talked about but rather we should, as fast as possible, try to find out whether our fears are grounded and whether ~~w~~ uranium will, ~~inxfade~~ in fact, emit neutrons when bombarded with neutrons. When I next saw Rabi I asked him how took it. "Well," said Rabi, "I told ~~mx~~ him what you said to me and all he said was 'nuts'" "Why did he say nuts?", I asked Rabi. "I don't know", said Rabi. "Why don't we go into his office, he may be here, and find out?"

So Rabi and I went over to Office and Rabi said, "I told Zillard what you told me and he wants to know why did you say nuts?" "Well,"

said "there is a remote possibility that uranium might ~~w~~ emit neutrons when you split it with neutrons and maybe bombs can be made if that is the case but I think that all this is very unlikely." "How unlikely?" I asked. "Oh," said "maybe a probability of 10%". "Well", said Rabi, "if I follow you and someone tells me of a 10%..... I do not consider this a very low probability. On the contrary, I would feel rather alarmed. I think we had better take this thing somewhat more seriously."

This conversation made it clear to me that it was useless to discuss this matter further until I could actually show that uranium will emit neutrons when it is split by neutrons. I was at that time not attached to any university or research institution. I cabled to England where I had a block of beryllium that was made to order for me in Germany. I located some equipment at Columbia University which was useable for the purposes of my experiment and which was in charge of Dr. Walter at Columbia University as a guest. He was at that time an instructor at the City College of New York. But in order to do the experiment I needed something else. I ~~a~~ needed about one gram of radium. At this point I appealed for help to Louis S. Straus with whom I had been in contact earlier and whom I kept informed of the developments. Straus was quite willing to help but he wanted some ~~part~~ sort of an ~~agreement~~ agreement concerning exploitation of the invention and I couldn't think of any agreement that would be flexible enough that could be entered into at this early stage. Finally, I borrowed \$2000 from a friend, rented a gram of radium, and with one hand holding the radium and the other the block of beryllium, I walked into Columbia University and asked them for permission to work there as a guest for the next three months. The experiment ~~xxxxx~~ actually took one day. The radium arrived on the second of March, Walter Zinn and I started to work at once and the third day of March we saw copious emission of neutrons from uranium under the action of the slow neutrons, the gamma

rays α of radium liberated from the beryllium. The number of neutrons coming from uranium were, of course, very small compared to the large number of neutrons that came from the beryllium. Because the neutrons emitted from the beryllium are slow and the neutrons emitted in the fission of uranium are fast we were able to distinguish the neutrons which came from the uranium by virtue of their greater energy from the neutrons which came from the beryllium. This is the reason why it was essential for the discovery of the neutronization of uranium to use, as a primary source of neutrons, the neutrons from beryllium. Who set up a different experiment for the same purpose at Columbia University thought at first that he would get by using a commercial, of fast neutron But after a few days of experimentation he saw that he could not distinguish the neutrons from uranium from the α neutrons of his fast neutron source (?) and in the end he had to borrow our slow neutron beryllium source in order to obtain results. In the process of the fission of uranium my first concern was agreement among the scientists to keep this result unpublished. As a matter of fact, I started to take steps in this direction one month before we were able to establish that uranium emitted neutrons. In January, a telegram was received at the physics department of Columbia University which was addressed to Blatchich (?). It was opened by the secretary by some mistake and its contents became known in the department. The telegram was signed by Holben, a collaborator of Joliot and read "Joliot's experiments secret". Blatchich had shortly before this time visited Paris, Joliot must have told him about an experiment he was doing, and now, as a second thought, Joliot must have decided that he didn't want his experiment talked about in America. Hence the telegram. If Joliot wanted to keep an experiment \times secret, I thought to myself, then I knew what the experiment was, and therefore I sat down and wrote the following letter to Joliot: The record is dated February 2, 1939. I quote: "The only reason for my writing to you this letter today

is", so the record reads, "the remote ~~possibility~~ possibility that I shall have to send you a cable in some weeks and if that happens this letter will help you to understand what the cable is about. This letter is, therefore, merely a ~~pre~~ precaution, and we hope an unnecessary precaution. When Hans Paper (?) reached this country about a fortnight ago a few of us got at once interested in the question whether neutrons are liberated in the disintegration of uranium. Obviously, if more than one neutron were liberated the thought of chain reaction would be possible. In certain circumstances this might then lead to the construction of bombs which would be extremely dangerous in general and particularly in the hands of certain ~~important~~ elements. It is of course not possible to prevent physicists from discussing these things among themselves and as a matter of fact the subject is fairly widely discussed here. However, so far every single individual has exercised sufficient discretion to prevent a leakage of these ideas into the newspapers. In the last few days there was some discussion here among physicists whether or not we should take action to prevent anything along this line from being published in scientific periodicals in this country and also ask colleagues in England and France to consider taking similar action. No ~~definite~~ definite conclusions have so far been reached in these discussions but if and when definite steps are being taken I shall send you a cable to tell you what is being done. We all hope that there will be no, or at least not sufficient neutron emission, and therefore nothing to worry about. Still, in order to be on the safe side efforts are made to clear up this point as quickly as possible. Perhaps you have also thought of the same things and have contemplated or started such experiments. Maybe you are able to get definite results at an earlier date which, of course would be very valuable to us, ending the present disquieting uncertainty. Whatever information on the subject you might care to transmit by letter or cable at some later date will I am sure be greatly appreciated. Also, should you come to the conclusion that publication of

such matter should be prevented your opinion will certainly be given very serious consideration in this country."

Now that I knew that neutrons are emitted in quantity in the fission of uranium my main concern was to obtain agreement among all of us that this phenomenon remain unpublished.and I as well as Enders and his collaborators, wrote up our results and sent it to the Physical Review in the form of a letter to the editor. I was in favor of asking the Physical Review to delay indefinitely the publication of these papers and I enlisted in favor of the policy the head of E. D. Wigner, in Princeton, Edward Teller in Washington. The thought the scientific result shall be kept secret was novel and revolting to some of those concerned. Fermi in particular disliked the idea very much. By the middle of March, Fermi, Teller, and I met in Washington in order to discuss whether or not our publication should be delayed. After a long discussion Teller decided to take my side of the argument and Fermi, in his characteristic fairness, not only bowed to this majority view, but undertook to go back to New York and to arrange through Professor Pigram, Chairman of the department, to inform the Physical Review that our papers shall remain unpublished.

Upon my return to New York I found....., Albert and Kovasky have done an experiment very similar to the one that Fermi had done on the neutron emission of uranium and published a letter in Nature disclosing the existence of this phenomenon. By now a number of my friends are convinced that withholding publication is the right policy. Among them was Victor Wiskopf. He cabled to Halben trying ~~to persuade them to~~ to persuade them to withhold also the publication and communicate their results to friendlyin manuscripts * privately. But Wiskopf also cabled Blackett and Wigner wrote to Dirak. One of the difficulties of this undertaking was the fact that those of us who were in favor of establishing the rule of secrecy in the field, could not prove in any way, could not make it even very plausible, that establishing a chain reaction meant the possibility of

producing atomic bombs. All we could say was that this was such a new field that we must make due allowance for unforeseen developments and that in view of the potential possibility of making bombs, the greatest caution represents the wisest course. Among those who thought that bombs were impossible even though a chain reaction might be possible, were Nils Bohr. Joliot and his group also took this point of view and decided that everything should be published from here on. I tried to convince my friends that Joliot's non-cooperation should not deter us from what we regarded as the wisest course. I thought that if Joliot continues to publish and we don't and if he is not informed of our results sooner or later he will be forced to fall in line and join the pool of those who communicate their manuscripts to each other privately rather than be left alone and remain uninformed of what was going on. However, Fermi, by now, was quite unwilling to go along,..... took a strong position against secrecy and only Herbert Enders (?) (Anderson?) among those who were actively working in this field came to see the merit of the course ~~which~~ which I proposed. Since we could not agree on this issue we agreed to leave the decision on up to Bigger (?). Then Dr. Pigram decided that we should publish our ~~results~~ results and this important decision like so many other important decisions which were to follow, were based on false premises. It so happened that Dr. Rabi visited Urbana, Illinois. One of the men whom I kept informed of my results was Dr. Goldharb in Urbana. When Rabi found ~~out~~ that Goldharb knew of the neutron emission of uranium about which I wrote to him he thought that the news was out and that secrecy would serve no further useful purpose. He so informed Pigram andPigram decided in favor of publishing our results. The fact that uranium emitted neutrons in the fission process made it likely that a chain reaction might be possible but be no means certain. So Fermi and I teamed up and with Herbert Anderson we set up an experiment that was designed to show whether or not uranium water system(?) could be made chain reaction. We worked very hard at this experiment/
End of record B-2

(Beginning Record A-3)

So much that when we found that uranium emitted more neutrons than it absorbed under the conditions of the experiment we thought that we had shown that uranium water system was chain reaction. We knew, of course, that neutrons are absorbed by the in the water but we thought we could reduce the amount of water. It did not occur to us that if we did reduce the amount of water we would increase the absorption of uranium and thus defeat our purpose. I do not know how long we would have persisted in this error had not Klatchek come to visit us and drawn our attention to the fact that we have not shown that the uranium water system could be made chain reacting. As a matter of fact, looking at our results more closely it was possible to deduce that most likely a uranium water system was not chain reacting even though it came very close to it. Plasek (?) proposed that we think in terms of using helium for slowing down the neutrons rather than water. There was some merit in this proposal but it was not a practical proposal. It was really most impractical, or at least we thought so. And from then on "Plasek's helium" became one of Fermi's standard jokes, in the labs. I, too, thought that helium was not very practical but I also thought that water was hopeless and I began to think about the possibility of a graphite uranium system. During the last few weeks of June, while Fermi still hoped that a water uranium system could be made chain reacting if the water and uranium are kept in layers and if the thickness of the uranium layers is just made right. By the end of June, our manuscript was ready to be sent to the printer and Fermi left to give a summer course at Ann Arbor, Michigan.

In the days that followed I became more and more convinced that a graphite uranium system will be chain reacting and thought that this could be demonstrated within a very short time if only we could get enough graphite and uranium to set up a large scale experiment. I first thought ~~that~~ that we might get some help from the Navy and discussed this possibility with Dr. Chew (?) of the Carnegie Institute in Washington who promised to

take the matter up with Ross Gard (?). This would have been our second approach to the Navy and I want to say something about the first approach. As soon as I knew that neutrons come off in the fission of uranium I telephoned Wigner in Princeton and Teller in Washington. Throughout all these years Wigner played the role of the conscience of the physicists. Wigner once came to New York and impressed upon ~~me~~ us the need to inform the government of the possibilities involved. At the urging of Wigner, Pigram telephoned to Charles Edison and asked Edison to set up an appointment for Fermi who was supposed to be in Washington anyway on the following day. Fermi did not get to see Charles Edison but he saw a group of people, which included Ralph Gunn who was scientific advisor to Office of Naval Research. At that time the Navy seemed to be unimpressed. But Ross Gard (?) showed some interest in the matter and so I thought that he would be our best chance to obtain adequate support.

The response to the second approach, this time through Chew, resulted in the following letter, written by Ross Gunn (?) to me.

"The Princeton (?) meeting of the Physical Society has been carefully considered. As I indicated to you at that time it seems almost impossible, in light of the restrictions which are imposed on government contracts for services, to carry through any sort of an agreement that would be helpful to you. I regret this situation but see no escape. We are anxious, however, to cooperate with you in every respect and appreciate your assistance on this important problem."

This letter was dated July 10, 1939. By the time I received this letter I was somehow convinced that the chain reaction can be set up in a uranium-graphite system. I bombarded Fermi with letters urging him that we adopt this line of research and that we go into it in a big way. I did not want to wait until the fall when Fermi returns but wanted to make all the arrangements necessary to enable us to work before the end of the summer. However, Fermi's replies were rather cautious, in particular a

letter which he wrote to Pigram, seemed to have the effect that Pigram was reluctant to do anything right away and wanted to wait for the fall term to begin. Therefore, I told Wigner about this situation and together we decided to take action independently of Columbia University, if Columbia University proved to be so sluggish. One of our concerns was that the Germans might get large quantities of uranium from Belgium. So the immediate problem seemed to be somehow to inform the Belgian Government that would be involved in uranium ~~discoveries~~ deliveries to Germany at this time. It occurred to me that Einstein knew very well the Queen of the Belgians. And so I suggested to Wigner that we see Einstein and enlist his help in getting the cooperation of the Belgian Government. I called up Einstein's office in Princeton and was told that he was spending the summer in Peconic, Long Island. So and I drove out to Peconic and tried to locate his house there. We were told that he occupied Dr. Moore's cabin but no one seemed to know where Dr. ~~Moore's~~ Moore's cabin was. Thus we drove around Peconic for about half an hour without any direction and were just about to give up when I leaned out of the window and asked a native boy who was standing on the roadside if he knew where Einstein's house was. This boy knew, though ~~xx~~ he had ~~never heard~~ never heard of Dr. Moore's cabin, and he volunteered to guide us there. This is how we found Einstein.

I told Einstein of my conviction that chain reaction could be set up in the near future in a uranium-graphite system and I showed him the manuscript of the paper which Fermi ~~h~~ and I had prepared on the water-uranium system.

Einstein saw the point at once and he was quite (a few words are garbled here) didn't seem to him such a good idea but he was willing to write to the Belgian Government and the only question was whether this should be done ~~directly~~ directly or somehow through a third party. we feel that if we go through the State Department. suggested that we draft a letter, send a copy to the State Department and inform the

State Department. (This is the end of Record 3-A and there is so much interference I cannot understand the last few sentences but it seems to end up: This is where we left the matter when Wigner and I drove back to New York. Wigner then left for the West Coast and I began to give further thought to the matter. Somehow it did not seem right to come in with such a record to the State Department cold and I felt that we needed

(Beginning of Record B-4)

And I thought that we ought to try to get in touch with the U. S. government in some other manner. Not knowing my way about I went to get advice from Dr. Gustav Stolper. Stolper was a German who used to be editor of the Deutsche Stolper was and economist who used to be editor of the leading economic journal in Germany and whom I know from the time that I lived in Berlin. I told him frankly our problem and he ~~recommended~~ recommended that I talk to Dr. who w had worked for Roosevelt in the past and who was at that time the Vice President and Economic Advisor to the Lehman Corporation. -----

We have one carbon of this
Dr. Szilard (Record S-10)

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July
In the first days of 1939 I realized the advantages of using graphite in place of water for slowing down neutrons. I wrote to Dr. Fermi who was in Ann Arbor a number of letters pointing out ~~that~~ the advantages of this system and later in July I made a simple computation that showed that the lattice of uranium bodies in graphite is likely to sustain a chain reaction. This system looked so promising that I went to ^{see} Professor Einstein. I the first one with Dr. Wigner, the second one with Dr. Teller and the letter of Professor Einstein to..... To this letter was attached a memorandum. Both the letter and memorandum were submitted in person by Dr. Sachs to the President. The President appointed a committee under the chairmanship of Dr. Briggs. ~~and on~~ ~~Oct 22nd~~ This committee met on October 21, 1939 and subsequently I submitted to Dr. Briggs a memorandum in which I stated that I calculated the chain reacting graphite uranium system in which C's of uranium metals were embedded in graphite. The memorandum also states that ^{Dr.} Fermi has calculated the homogenous system of uranium in carbon. In February 1940 I sent a paper to the Physical Review on a divergent chain reaction in a uranium-carbon system. In this paper a lattice of uranium metal spheres in graphite was calculated and it was stated that this system will sustain a chain reaction. The calculations were refined later on and by ~~the~~

The first of November 1940 at the time that Columbia University obtained its first contract for the development of the Fermi-Szilard system of chain reaction. We would have been in a position, if we chose to do so, to describe a chain reacting unit giving the correct _____ and sizes of the uranium body and the correct ratio of uranium to carbon in the system so that a sufficiently large pile built on the basis of these principles would have maintained said sustaining chain reaction. Such a system was actually set up in Chicago and made to operate on Dec. 2, 1942. The actual experiment was under the direction of Fermi. Early in 1943 we were told that the government was interested in taking our patents in this field. I suggested to Dr. A. H. Compton who was the director of the metallurgical laboratory at the University of Chicago where this work on uranium was carried out they should take me off the payroll so that during the time when I write down my inventions for the record I shall not draw salary which comes indirectly from the government. Correction: I told Dr. Compton that my contribution to the chain-reacting system predated my employment on any government contract and I would therefore appreciate if an agreement were drawn up in which I would assign my inventions to the government for a reasonable financial consideration. In order to enable the government to enter into a discussion of this subject I proposed to Dr. Compton that I will write down my inventions in the form of a patent application but that I will not file this

application but use it in my discussions with the government representatives. I proposed to Dr. Compton to keep me off the payroll until such time as I have finished this writing job because I did not feel that I ought to draw government salary while I was working on these patent applications. C

Captain Lavender, who represented both _____ and the War Department in this matter discussed with me my inventions and early in 1943 told me that he was going to recommend that I be offered \$25,000 for all of my inventions in this field which I made prior to accepting employment under government contract. He also told me that I will either have to accept this offer or that I will have to leave the project. Correction: Captain Lavender, of the _____, representative of the War Department also in this matter, entered into discussion with me of my inventions. When I completed my writing down of these inventions I asked Dr. Compton to be put back on the payroll. Dr. Compton informed me that he was under orders of Gen. Grove not to put me back on the payroll until Gen. Groves gives his explicit permission. Having completed my writing job I went back to work without pay and I did not receive pay throughout the year 1943. After I assigned all my inventions to the government an arrangement was made under which I received back pay for the year. But throughout the year 1943 I worked on the project without receiving any pay.

~~Shortly after Capt. Lavender~~

Captain Lavender after a while informed me that he was going to recommend that the government pay me \$25,000 for all of my inventions, made by me before being employed under government contract. He explained to me that I will have the choice either to accept this sum or else that I would have to leave the project. The reason for this, so Capt. Lavender explained, was that if I remained on the project and did not reach an agreement with the government I would have a claim against the government and I would be strengthened in this claim by the knowledge I would acquire if I continued to work on the project. Shortly thereafter Dr. Compton came to me and said that he had been ordered to cut me off from all secret information until such time as I had assigned all my inventions to the government. He told that there was no other way for him to do this but to ask me not to come to the laboratory any more since technically there was no way to cut me off from secret information in any other way. ~~I told~~ ~~Dr. Compton that I was~~ At that time I was ~~connected with~~ engaged in working on some problems in connection with the construction of the Hanford plant. Most of the problems of the Hanford system were solved with a few rather difficult problems remaining and I was, in fact, able to solve one of these jointly with Gale Young

In these circumstances I said that I cannot leave the project and ~~it~~ ^{between} ~~is it~~ told Dr. Compton that if it comes to choosing/remaining on the project and retaining the rights to my inventions or signing away inventions to the government and remaining with the project, I have no choice but to choose the latter. I told Dr. Compton also that I would write to Dr. Vannevar Bush protesting against being forced to assign my inventions to the government on the government's terms. At the same time I would offer the government, through Dr. Bush, to enter into an undertaking whereby I would renounce forever making any claims arising out of my inventions against the government

Dr. Compton, thereupon, ~~agreed~~ agreed that I should remain at work. I wrote this letter to Dr. Bush and received from him a non-committal answer. I was given to understand ~~that~~ that my offer to renounce all claims against the government would not suffice. In December 1943 I was told that Gen. Groves would come to Chicago and that it would be necessary for me to give final answers on the government's demand that I assign my patents to the government.

I met Gen ~~Groves~~ Groves, Capt. Lavender and Col. Metcalf and I asked Gen. Groves whether he would be willing to ~~say~~ say that I can remain working on the project whether or not I assigned my ~~inventions~~ inventions to the ~~government~~ government on the government's terms. Gen. Groves said that he was not

willing to say so. I then asked Gen. Groves whether he would say I cannot remain working on the project unless I assigned my inventions to the government and Gen. Groves said that he wouldn't say so because this would be duress. I thereupon stated the following: that I believed, as did many of my ~~colleagues~~ colleagues, that the Germans were ahead of us in this development: that under these circumstances I felt that I cannot leave the project and since I assume that I will have to leave the project if I didn't assign my inventions to the government, I will assign these inventions but not on the government's terms. I felt that I would not accept the \$25,000 offered by Capt. Lavender but instead would take a sum equal to my expenses. I submitted an itemized list of these expenses which amounted to a total of \$15,000 plus. The bulk of these expenses consisted in the price of a settlement which I had to make in order to acquire clear title to my inventions. I had ~~then entered into a~~ then entered into a contract in ~~1934~~ 1936 with a private party and the government representative ^a thought that I would have to buy back this contract if I wanted ~~the~~ clear title to my inventions and assign those inventions to the government.

In July 1939 I recognized for the first time that there was a good chance of maintaining a chain reaction in a uranium-graphite system. (??)

~~On the following day I wrote a letter to the government~~ The only item which was not an out of pocket expense in the list of expenses were my living expenses

in the amount of \$333.33 per month covering the period from March 1939 to November 1940 during which time I worked at Columbia University but received no pay.

On the following day I signed a contract which assigned all of my inventions to the government. The contract contains a rubber stamp which expresses the thought that I signed this contract of my own free will. I never had seen such a clause stamped on any of the previous contracts which I have ever signed. On the next day I dictated a memorandum addressed to Dr. Compton which is now in my files that I left in the custody of the Atomic Energy Commission when I left the project in 1945. In this memorandum I summarized the conversation with Gen. Groves which ^{led} ~~xxxx~~ me to sign the contract with the government. Upon the signing of the contract a separate agreement was drafted which enabled me to receive back pay for the year 1943 during which I worked but was kept off the payroll. Also at the signing of the agreement I was put back on the payroll of the project. (End of Record 11)

(Begin Record 12)

In November 1940 a contract was given to Columbia University by the government for \$40,000 for the purpose of developing the Fermi-Szilard system of establishing a chain reaction in uranium. My main concern was to get uranium, if possible in the form of metal, of sufficient purity and to get graphite of sufficient purity to make a valid experiment. What we wanted mainly to do is to test directly by measurements on a pile composed of graphite and a lattice of uranium containing bodies whether or not said sustaining chain reaction can be expected to occur if the pile were made sufficiently large. We did not have funds to purchase materials in any appreciable quantity but _____ promised that such funds would be made available through the National Bureau of Standards which was supposed to purchase these materials for us. The trouble was that these materials could not be obtained in sufficient purity commercially. By having to negotiate for them through the ~~Bureau~~ Bureau of Standards became a major bottleneck of ~~progress~~ progress. Varied contacts with manufacturers of material is very important if no finished product is commercially available because only through private conversations can you discover how the quality of the material might be improved. One important fact came out of a casual conversation with representatives of the National Carbon Company. Fermi and I had lunch with two men from the National Carbon Company from whom we expected to buy

some graphite. The graphite seemed to be fairly pure and the total impurity would have been dangerous only if it has contained some element that was very strongly absorbing neutrons. When we had our luncheon I said, half-jokingly to one of these men, "You wouldn't put boron into your ~~graph~~ graphite, or would you?" The two men looked at each other and there was an embarrassed silence.

"As a matter of fact," said one of them, "samples of graphite which come from one of our factories contain boron because it so happens that we manufacture in that factory graphite electrodes for electric ^{arcs} ~~experiments~~ into which boron is customarily put. Had we ~~negotiated~~ as we were supposed to do with these men through the National Bureau of Standards we would have never discovered this important fact.

We had worse luck with uranium. We were given the specifications of the uranium oxide which was supposed to be delivered to us and the uranium seemed to be pure enough on the basis of those specifications. But then on a visit to the factory which made uranium metal out of the uranium oxide for our experiments we discovered another list of impurities which differs from ours which was much worse. This was a purely accidental discovery. It led us to ^{re-examine} ~~examine~~ the uranium which was delivered to us and it turned out that our uranium was equally impure. ~~When~~ When I looked into the process how the uranium was purified I was struck by the fact that an

important group of elements which were strong neutron absorbers if _____ they were never removed from the finished product. But when I ~~dismissed~~ discussed with the National Bureau of Standards whether we shouldn't change the procedure of purification I was told that the process which would improve the quality would take a long time to prepare and since we were in a hurry to get the chain reaction going the Bureau of Standards was not willing to advocate a change in the chemical purification. Because all these troubles were besetting us I got more and more impatient during the first half of 1941. Somehow we did not seem to be able to get the things done which we knew needed to be done. During this early period I was also haunted by the fear that it might be possible to detonate the uranium metal by fast neutrons if a sufficiently large quantity of this metal is assembled. Whether or not this is possible depended on the following thing: the bulk of natural uranium is Uranium 238 and it fissions only if it is hit by fast neutrons. In this fission it emits fast neutrons and whether or not a chain reaction can be maintained depends on how fast the neutrons emitted for fission are slowed down so that they might lose their effectiveness if further uranium.

Dr. _____ and I pursued therefore a side line ~~investigation~~ investigation to determine how fast uranium metal slows down fast neutrons and we did not stop this line of investigation until we were satisfied that uranium metal cannot be used to make a bomb.

Things would have dragged on in a most ~~xx~~ unsatisfactory way had not the British recognized that ~~atomic bombs could be made from~~ it is possible to separate sufficient quantity of Uranium 235 to make atomic bombs. Anybody could recognize this fact: ~~when we~~ we knew two things - how much uranium ? could be separated with a reasonable industrial effort and how much (U 235?) it took to make a bomb. At Columbia University ~~Max~~ Urey and the _____ office of worked on Naval ~~Research~~ Research/~~talked~~ of the separation of uranium isotope 235, ~~While~~ While Fermi and I worked on the nuclear properties of uranium. It so happens that I actually measured the cross section of Uranium 235 for medium velocity neutrons in the first half of 1939 . From this I could have computed how much Uranium 235 it takes to make a bomb. The amount seemed fairly large and I did not know that it was possible to separate such quantities of ~~uranium~~ uranium 235. Urey's contract specified that he was not supposed to discuss his results with Fermi and me who were not fitted and therefore we were not able to put two and two together and come out with a simple statement that bombs could be made out of reasonable quantities of ~~uranium~~ uranium 235. In Britain there were a number of German refugees such as Simon _____ and Fish (?) who at the beginning of the war were not permitted to work on anything of military significance and therefore took to working on uranium. Simon was interested in the separation of uranium 235, Fish

and and Paris (?) were interested in nuclear properties. Nothing prevented them from talking to each other. They put two and two together and they informed the British government of the possibility of making Uranium 235

The British Government informed the American Gov. bombs with quantities of material that were industrially available./ So for

attention
the first time our ~~direction~~ was directed to the problem of making atomic bombs rather than merely to the problem of making a chain reaction of producing parts for driving submarines. _____ chain reaction now began to appear in terms of making _____ (plutonium) chain reaction to make

bombs and for the first time the government realized that our project was important. Oliphant came over here from England and attended a meeting of the Uranium Committee which neither Fermi nor I were permitted to attend. He realized that something was very wrong and that the work on uranium was not pushed in an effective way. He discussed his concern with Hugh Lawrence who in turn approached Compton and as a result of this agitation it was decided to reorganize the project. A. H. Compton was supposed to be in charge of setting up a chain ~~xxx~~ reaction with a view of producing plutonium. Mr. Urey was supposed to be put in charge of separating Uranium 235 by the fusion method and Lawrence was supposed to be in charge of separating Uranium 235,

by _____ method. Actually reorganization took place around the first of Jan. 1942. At that time the project from Columbia University was moved to Chicago and all of the grant funds were put at the disposal of the project. However, even now the authority to purchase materials was not given to the project. (End of Record S 12)

(Begin Record S-13) While negotiations for materials formerly had to go through the Bureau of Standards now ~~now~~ the purchase of negotiations for materials had to go through Murphy of Standard Oil of New Jersey. This division of authority hampered us throughout the first half of 1942. In spite of this somehow A. H. Compton managed to make arrangements for obtaining uranium purified in the right way so as to _____ uranium from neutron absorbing substances which the older way of preparing it did not remove. As purer grade uranium was obtained and _____ uranium metal began to come in it became clear that a self-sustaining chain reaction would be achieved. This much was clear to most of us including A. H. Compton, Director of the Project, in the spring of 1942. And on December 2, 1942 the chain reaction was actually started at _____ Stagg? Field on the campus of the university. As soon as it became clear that the chain reaction will succeed my attention and also the attention of _____ turned toward the problem of having an effective cooling system and of solving the technological

and engineering problems belonging to these cooling systems, So that a reactor high-powered output can be constructed and sufficient quantities of plutonium can ~~ben~~ be manufactured. There was a feeling in the Project that the cooling of a reactor is not a problem for physicists to worry about, that this is an engineering problem and should be entrusted to engineers. There was an engineering group set up in the project which set up an advisory committee having 8 members and I was one of the members but E. P. Wigner was not put on the committee since it was clear that Wigner thought more about engineering problems taking due regard to the physics involved than anyone has. I tried to correct this omission but I did not succeed and _____ took a position that they did want to enlarge the committee for it would be ~~unwieldy~~ unwieldy. This engineering group then decided to adopt the cooling system such as a car cooling system, Number 1, and develop the process design along this line. ~~Neither~~ Neither I nor Dr. Wigner thought that this design was good or that _____ approach of the cooling system # 1 was acceptable. Wigner therefore tried to get an engineer attached to his group of physicists in order to work out an alternative system which I shall call system #2. It took a long time before the engineering group agreed that he should have an engineer, but finally he was given an engineer and they walked away quietly trying to develop with one engineer and a number of _____ physicists what we

might call a cooling system #2. When, at the end of 1942, the ~~Co.~~ _____
 Company took over the construction of the plant for the ^{manufacture} ~~production~~ of plutonium
 the official recommendation of the Project adopted the cooling system #1 advocated
 by the engineering group. After the _____ Company had a few weeks opportunity to
 study the system Dr. Wigner presented to them a process designed for system #2
 which he had worked out with one engineer. The _____ company decided to use
 system #2 rather than system #1 which was unworkable. Physicists in the project
 were unhappy about the way cooperation with the _____ Co. was set ~~up~~ up. The
 DuPont (?) Co. had very good engineers but they did not have the required
 knowledge of nuclear physics. They were supposed to draw up the plans and
 the Project was given the right to object to any given solution ~~with~~ which the
 DuPont Company may put forward. Clearly this is a very peculiar way of arriving
 at a design and for a long time most physicists on the Project did not believe
 that the DuPont Company will be able to produce a workable design on the
 basis of this trial and error procedure. [The decided that it
 was not a good design but a design that worked. At least it worked for a
 while. And after went into operation they were able to deliver
 material during the war without any serious hitch.] The disagreement
 about the cooling system to be used put the form of a fight between the
 physicists and the engineers. The issue was, should the physicists be
~~allowed~~ permitted to make their own designs or should all designing be
~~concern~~

concentrating in the engineering group and the physicists merely act in an advisory capacity. This fight reached its end, of course, automatically at this time, when the Dupont Company took over the construction of the parts, for the responsibility was then clearly assigned to the Dupont Company. But gradually, the fight ended to the temporary victory of the engineers. Dr. Compton instructed ~~the~~ the physicists to cease working on the process designs and to act as consultants to the engineering group. When the engineers came over to ask Dr. Wigner for his cooperation, Dr. Wigner asked, "What do you want to do?" "I mean, what do you want me to do?" "Well," they said, " ~~xxxx~~ all we want you to do is ~~answer our questions~~ answer our questions." "Oh," said Wigner, "if you know the answer to which what questions to ask, you will find/~~that~~ any question/you might ask and which I can answer in my files. All I have to do then, is give you the key to my file, which I shall be very glad to do. Obviously, in order to know ~~what~~ the right answers otherwise you don't know what the right questions are." And this kind of cooperation would have lead ~~up~~ us ~~xx~~ nowhere had we, in fact, adopted it. After it became clear that half our plans were successfully operating, the Chicago project relaxed. It then became possible for the physicists to take a ^{more} detached view and some of us began to think of the wisdom of making bombs, testing bombs, and using bombs. In March 1945, which was clear that Germany was defeated and after the defeat of Germany

it was clear that Japan could not hope to win the ~~a~~ war. I personally thought that using the bomb against the cities of Japan would be a great mistake. And ~~a~~ I drafted a memorandum raising this issue, And the issue of what the existence of atomic bombs would mean after the war, the need for international control in this field, This memorandum I to the project and I found that many people ~~xxx~~ agreed with the views expressed in it. I therefore decided to get this memorandum into the hands of the President. There was no hope of accomplishing this by ~~g~~ going through channels. I therefore asked for an appointment with Mrs. Roosevelt with whom I wanted to discuss how at best, to get this memorandum to the President. The appointment was set for a date in April. By this date and when I had this date I finally submitted ~~a~~ the memorandum to Dr. A. H. Compton, Director of the project, for his information. I expected that Dr. Compton would urge me to go through channels but after he ~~read~~ read the memorandum, to my surprise, he simply said, " I wish you would get this into the hands of the President." Greatly relieved, I left his office and returned to my own office to attend to some business. I had not been for in my own office/more than a minute or two when there was a knock on the door and there ~~stood~~ Compton's assistant, ~~Compton~~ who had just heard over the radio, he said, that Roosevelt had died. Mrs. Roosevelt, of course,

cancelled the appointment~~an~~ and here I stood now with the memorandum and did not know what to do with it. It was clear that we ~~only~~ ought to get the memorandum to President Truman but no one whom I knew seemed to know President Truman. Finally, it occurred to someone that our being a ~~lx~~ very large project, there ought to be someone among the physicists from Kansas City. We went through a list of names, found our man and within two days had an appointment at the White ~~House~~ House. We saw the executive secretary of the President.~~but~~ By "we", I mean Dr. Bartky (?), the Associate Director of the project, who accompanied me, and I. He read the memorandum and said, "Oh, I see. This is serious business. I was a little skeptical, at first, because this appointment came through Kansas City." (The secretary of the President, Whom we saw was Nat Connolly.)

"The president has asked me," said Nat (?) Connolly, "to make an appointment and for you with Mr. Burns. Are you willing to go/see him in Spartensburg, South Carolina. We did not know right away that I was ~~supposed~~ supposed to see Burns. At that time, Burns was out of the government, and we did not understand why we were supposed to see him until a few weeks later when we heard that he had been appointed Secretary of State. ~~At~~ At an area point to be designated later I went to see Einsten. I was not free to tell him what the trouble was. All I could tell him was that there was

serious trouble and that a serious mistake might be made unless the President intervenes. I asked him to write another letter to President Roosevelt his earlier letter and suggesting the President give serious consideration to whatever we may put forward for his attention.

I gave the memorandum and Einstein's letter ~~to the President~~ for President Roosevelt to Mat Connolly. (End of Record S13)

(Beginn~~ing~~ of Record S14)

We asked Mat Connolly if it would be alright if Dr. Came along to see Burns, and he agreed. We telephoned who joined us in Washington and we went ~~at~~ to see Burns in Spartensburg. Burns read the memorandum and seemed unimpressed. When I mentioned to him the dangerous situation that would arise if Russia had a stockpile of atomic bombs, he said, that he had been informed that Russia has no uranium. At the request of Stevenson (?) the President had appointed the Committee to decide on ~~a~~ whether or not the bomb shall be used and in what manner. Burns was a member of this committee but at the time that we saw Burns, the Committee had not yet met. (May 28th) Gross(?) paid one visit to Burns and gave him ^a ~~an general~~ briefing of the situation.(unable to make this out).....

I told Burns that ~~onsuch~~ on such a vast territory as is Russia it was

exceedingly unlikely that low-grade uranium ores could not be found, and for the purpose of making atomic ~~bomb~~ bombs, low-grade uranium ore was perfectly usable. So at this time when uranium was mined in order to produce ~~radium~~ low-grade ores are not economically utilizable. And therefore, only high-grade ores were worse. Disregarding this argument, it was a matter of record that Czechoslovakia had uranium and Russia was in possession of Czechoslovakia. Since we did not know what Burns represented, whether he was supposed to be the ~~nd~~ new Secretary of State or the new man in charge of the uranium project, our was not very purposeful. We talked to Burns about the need of preserving the theme in the uranium project even though the individual projects would have to be dissolved. I remember that was particularly concerned about this point and so was I but this, of course, was none of Burns' business, except that we didn't know it. When I raised the question of whether the bomb should be used. Another question was whether the bomb should be used. If it were true that ~~a bomb~~ in post World Wars the bombs existence was a great danger to us, as I believed it was true, then I should consider, so I said, whether we ought not ^{keep} ~~to/kept~~ existence of the bomb secret, at least for a while until we can make up our minds in what manner we ~~an~~ want to control this situation. I therefore, raised the

question of whether it wouldn't be wiser , assuming we wanted to keep the existence of the bomb secret, to refrain from testing the bomb . Once the ~~bomb~~ bomb was tested as it was already tested in too many people knew of its existence, to keep it secret from there on. The was this, that if we had more time to discuss what kind of international control we want ~~xxxxxxxx~~ to propose, that in the meantime~~xxx~~ our~~xxxx~~ stockpile ~~x~~ can be greatly increased and we'll be in a better position to make ~~xxxxxxxx~~ a generous proposal to Russia, and if the proposal is not accepted we'll be in a very strong atomic position, with respect to them. Looking back, these talks appeared to me fittingly naive.will not think through the difficult problems of international control until they are forced to do so, and if we had postponed testing the bombs, we would have also postponed thinking about the consequences of the bomb. As to using the bomb, Burns thought that the government would be in trouble to explain if it later turned out to be that we had the bomb and did not use it. Why were we willing to prolong the war when we had such a potent weapon which would have ended it? He also thought that it would be possible, by not testing the bomb, to create the impression in Russia and elsewhere ~~xx~~ that the project had been a failure. But he thought that if we did not test and use the bomb it

would be impossible to continue the development of atomic energy. So, how are we going to justify to Congress having spent two billion dollars and nothing to show for it. How could we ask Congress to appropriate any further money for the development of atomic energy,,if we didn't demonstrate the usefulness of atomic energy, by using the bomb. Burns had another argument. He was concerned about the way the Russians threw their weight about. They occupied Rumania, Hungary, Bulgaria and we have difficulties with the Russians in Poland. He thought that if we use the bomb and showed our great power, Russia would be more manageable. "You would not want the Russians to^{stay} ~~saxx~~ in Hungary" he said to me, "or would you?" This argument shut me up for awhile for while I was concerned about Russian domination of Eastern Europe, and while I was concerned about the fate of Hungary, it offended my sense of proportion to decide an issue of such importance for the United States and the rest of the world from a point of view of what is better for Hungary. Perhaps more important than that, I was greatly disturbed at Burns' argument that by showing the power of the bomb we might expect the Russians to be more manageable in negotiations over Eastern europe. This was so far from what I thought was sound psychology that I faced of the world if men, basing their thinking on this kind of insight, occupy high positions in the classes of the government.

The thought crossed my mind, how much better it might have been for the world if Mr. Burns had been born in Hungary and become a physicist and if I had been born in this country and become a statesman. It seemed to me the world would have better off on two counts in this case and maybe there would have been no bomb. After the conversation with Burns, I returned ~~tax~~ to Chicago and found considerable education there. was very much disturbed about our excursions and summoned Dr. Bartky (?) to question him about what transpired. He told Bartsky that I grossly violated security rules by giving Mr. Burns a document of this sort. "Mr. Burns," he said, "does not know how to handle secret documents. In the meantime, we were advised that a Committee has been appointed under the chairmanship of which would consider the use of the bomb and there should be four physicists, namely, Fermi..., Lawrence, Compton, and Oppenheimer, were to represent the scientists before this committee. The composition of the Committee and the selection of the physicists disturbed us for while the physicists are all good men, they are men who could be expected ~~tax~~ to play ball on this occasion.

Oppenheimer, we thought, would not oppose the using of the bomb which he tried to make, so hard. ~~Fermi will~~ state his ~~opinion but~~ opinion but will not insist, that it should be heard and will not state it a second time.

Compton might be against the use of the bomb but he would not want to incur the displeasure of the powers ~~to be--~~ by ~~stressign-t-~~ stressing this point of view. And of Lawrence's position we knew too little to be comforted.

Thesection took the form of a letter to the Secretary of State which was signed by almost all the important names in the Chicago and Oak Ridge project. This memorandum asked that Dr. A. C. be added to this group of physicists. We knew that will form an independent opinion of his own and that he will ~~fight--n--~~ fight for his opinion.

This proposal, however, was rejected by the Secretary of War in a polite letter. I knew then that a Committee was loaded and the decision was a foregone conclusion. There was nothing more to do than to go on record and the best way to go on record seemed to be to write a petition to the ~~President~~ President. I drafted two versions of the petition. The first one, which was somewhat stronger, was signed by fifty people in Chicago and the second, which was somewhat weaker, was signed by sixty-three. The second petition was dated one day before thetest,, of the bomb. I originally planned to bring it to the White House in person but I was persuaded..... by some of ~~this~~ those who felt they would sign only if the petition was sent through channels. I regret to say that I agreed to send the petition through channels as a result I do not know ~~what~~ whether the

President ever received the petition or not. The channels were, of course, through the ~~Manhattan~~ Manhattan district. Shortly before the bomb was dropped, several of us were given different chapters of a report written by Smythe (?).

We were ~~who~~ asked to sign a receipt stating that we have read and approved of this

report. Choosing from the chapters which I read the report gave away

what might be considered ~~important~~ important secrets. For the important

secrets are the general ideas and the knowledge of the methods that actually

worked rather than the blueprints. In the absence of all clear thinking,

concerning international control of atomic energy it seemed to me unwise

to disclose that much information as was contained in Smythe's report.

It would have been a different matter if we had known precisely along

what lines we might want to negotiate towards international control. I

(End of Record S14-Beginning
asked the Captain ~~who~~ brought me the report, what the ..text... had meant
of Record S15)

that I read and approved of the report. Did approved mean that I

approved the text as correct or did approved mean ~~that~~ that I approved

that this text be published. The Captain did not know. So, I took my

pen and I scratched out the words "I approve" and merely signed that

I read the report. Later on, General..... during a controversy of

~~whether~~ & whether or not the report should be published disclosed that he

sent the report to all the physicists and chemists who were essentially

involved in this development and he made them sign a statement that they approved of it and they all signed except one. I do not know how many of those who signed thought that what approved meant that they approved the correctness of the ~~text~~ text, rather than the intention of publishing such a report. I know that there were several other~~xx~~ men in the Chicago project,~~1~~ among them..... who were very doubtful about the wisdom of publishing this report. In retrospect, the Smythe report probably did not give away very much. I doubt that it eccelerated construction of the first Russian bomb by any appreciable amount. Our secrets were not secrets at the time when the Smythe report appeared.

..... because Russia received information through Smythe

.....because they gathered up the same information themselves.

The bomb was dropped on Hiroshima on August 2, 1945, and ~~h~~ shortly afterwards, the second bomb was dropped on Nagasaki. The general public responded with joy but the majority of those with whom I was in contact in the uranium project were concerned. "Dropping the bomb on Hiroshima," said S. K., "was a tragic mistake." "Dropping the bomb on Nagasaki," he said, "was an atrocity." I believe he summed up correctly the feeling of most of the physicists. The excess of moral indignation among the general public astonished me so I took time out ~~at~~ to

visit at Bishop to find out how the Catholic Church felt
 about this and I found that they hadn't given it much thought. I got
 very much the same impression by talking to other Church leaders. Apparent-
 ly it took some time. Apparently, the moral consideration alone is not
 suffiecient to ~~affere~~ arouse the churches to process these days. And
 only later on when the possibility that such bombs might be dropped upon
 us did most prople discover that there is a moral issue involved, in
 throwing atomc bombs on cities and killing, ~~in~~ indiscriminately, the in-
 habitants. I felt there was a great need to try to make people understand
 what atomic bombs meant for the worldand so I asked Hutchins to call a
 small conference of about twenty-five people. A closed conference ^{for} of a
 three day meeting ^{on} ~~of~~ the Campus^{of} the University of Chicago/ ^{soon after Hiroshima.} The selection
 of participants was rather a ~~lucky~~ lucky one. The participants stretched
 from Henry Wallace to Charles Lindburg, and inbetween there was
 Lillianthal, and Chester Barnard. Many of these people met for the first
 time in their lives. Somehow we managed to cover a number of important
 topics in these three days. We discussed everything from preventing war to
 international control of atomic bombs. And another by-product of the
 conference was the appointment of Dr..Compton, as Director of National
 Bureau ofStandards. After the ~~confereden~~ conference, I decided with

Compton that we would go down to Washington and try to determine to what extent the significance of the bomb is understood in Government circles.

William.....had been just appointed Assistant Secretary of State under Burns and he gave a dinner at his house for the top desk people of

at

the State Department ~~to~~ which Compton and I spoke. What we told these people was news to them. We told them that it will not take very long until another country such as Russia may have the bomb and that in the long run the balance of power will not remain in favor of the United States as a result of the development of atomic bombs. It seems that none of them ever thought of this possibility and that they appreciated having their ~~attentive~~ attention focused on it. While we were in Washington we picked up more or less accidentally, a bill, the so called *May* Johnson bill for the control of atomic energy which had been prepared and printed and referred to the House Military Affairs Committee. When I got back to Chicago I read in the newspapers that a hearing was held at which the supporters of the bill spoke and that the hearings were thereafter closed, the ~~the~~ committee preparing to report the bill out to the ~~the~~ floor of the House. I gave the copy of the bill which I brought to the Law School and asked them for an opinion. The response was a state of alarm. The bill provided for a part-time board that would appoint a full time manager and an assistant manager.

.....this board were appointed by the President but ~~we~~ could not be disposed by the President and the ~~manager~~ entirely removed from the control of the ~~comptroller~~ and President. The thought of carrying out the business of atomic energy , the part-time board that appoints a manager did not appeal to the Law School neither did it appeal to me. It so happens that A. H. Compton came on a visit to Chicago and addressed ~~the~~ a gathering of the members of the conference. So we asked Compton what he thought of the bill. Compton understood that it was a good bill but he had not read the bill. But then Compton went on and said something that deeply shocked us. Immediately after the bomb was dropped on Hiroshima we were requested to refrain from discussing atomic energy in public but this was not explicitly said the impression was somehow created that the restraint we were asked to exercise was due to the fact that important international negotiations were under way on the control of atomic energy. And believing this to be ~~the~~ true, we all complied. But now Compton told us that this secret of silence was made by the War Department in order to be able to pass a bill on the control of atomic energy "/////////." without unnecessary discussions in Congress." When I heard this I really got mad and said at once that I thought it was a duty to fight any attempt to smuggle a bill for the control of atomic energy through Congress. It so happened that on the

day I received a telephone call from Hutchins, asking if I would see someone, telling me he had ~~lunc~~ lunch with Marshall Field and that Marshall Field wanted me to talk with someone on the Chicago Sun about atomic energy. I told Hutchins that I would be glad to do this but in that case that I would also like to talk with someone from the Chicago Herald Tribune. I told the representatives of both newspapers that there was an intent to smuggle a bill through Congress and that we were asked to keep silent and that we complied but that we are not going to keep silent any longer now that we know the purpose which that silence was supposed to serve. Because the information I received was in a closed meeting from A. H. Compton I thought that I must not identify the source of my information or even identify myself. This, I now know, was a mistake. But because I was not willing to be identified or disclose the source of my information, the Chicago Herald Tribune said that they couldn't print the story. The Chicago Sun made it a story on the front page. This front page story of the Chicago Sun was an opening shot in the fight of the scientists against the *May*...Johnson Bill. Compton and I went back to Washington. Because of that all the physicists on the scene were eager to talk to us. We talked to the members of the House Military Affairs Committee and convinced them that something was wrong in the manner in which this bill was being pushed through Congress.

These members arranged for a meeting with Chairman ~~Max~~ May who later on served a jail sentence in Kentucky. But May refused to be swayed and a few days later he announced to the newspapers that the hearing which had been closed would remain closed in spite of Dr. Compton's and my urging that they be reopened. In the meantime we go in touch with ~~xxx~~ an atomic scientist group that had been formed in Chicago, in Los Alamos and in Oak Ridge. Oak Ridge under the influence of Oppenheimer favored the passage of the May-Johnson Bill. Oppenheimer was told and he believed it that no international control of atomic energy can be negotiated until Congress passes a bill of the control of atomic energy. Therefore, thinking that ~~internati-~~ international control of atomic energy was more important ~~thata-a---~~ than anything else, Oppenheimer was all in favor of passing a bill fast. Any bill as long as it was a bill. For a while, Los Alamos, followed Oppenheimer. Oak Ridge in Chicago, however, became ~~feea~~ vocal in the project. But the pressure which ~~they-~~ developed became so strong that the hearings had to be reopened. They were not reopened for long, just for one more day. One night I received a telephone call from the Office of the Military Affairs Committee of the House whether I would be prepared to testify the next morning ~~g~~ against the bill. I said I would. "Who else could testify

"

against the bill," they asked me. There was only one physicist in Washington

who knew something about atomic energy. This was Herbert Henderson, the young co-worker of Enrico Fermi. Henderson said he was willing to ~~testify on~~ testify on such short notice and I so informed the committee. The two other witnesses were asked to testify by the War Department. They were A. H. Compton and Robert Oppenheimer. ~~The~~ (End of Record S15 Beginning of Record S16)

Whether both testified in favor of a bill or apparently did so, their testimony was most lukewarm. If they were for a bill, at all, they were for the bill only because they thought another bill might even be worse. In view of the composition of the House Military Affairs Committee their view was perhaps not entirely unjustified. Oppenheimer's testimony was a masterpiece. He talked in such a manner that the Congressmen present thought he was for the bill but the physicists present all thought that he was against the bill. He was, for instance, asked, at one point, by a Congressman, "Dr. Oppenheimer, do you think this is a good bill," And Oppenheimer answered, "Dr. Busch thinks this a good bill and Dr. Koner thinks this is a good bill and I have a very high regard for both Dr. Bush and Dr. Koner (?) . To the Congressmen this might mean that Oppenheimer thinks this is a good bill but no physicist believes that Oppenheimer will form an opinion on the basis of his good opinion of somebody else's opinion.

So to the physicists present in the audience this

..... After this one day of hearing, the hearings were closed for

good. So, on a subject of such vast importance as atomic energy the House

Military Affairs Committee thought that the bill could be passed on the

basis of two days of hearings. But as Dr. Compton and I found as we

went around Washington, no one was really very much in favor of the bill

except the War Department. The Navy didn't care very much for it and

the Interior didn't think much of it. The Department of Commerce thought

the bill was bad. The White House had not taken a position even though

for a while the impression was created that the bill was an Administration

bill. ~~The Department of~~ Mobilization The office of War and Reconversions

which was in charge of steering bills through Congress didn't like the

bill at all. We did not have very much more to do than to tell everybody

what everybody else thought of the bill in order to kill the bill. As a

result of this activity, the bill never got through. "You boys did a good

job," said someone to us in the Office of War Mobilization Reconversions,

"but you never understood what ~~that~~ this bill really said. Did you notice

that the bill ~~said-that~~ specifically says that the manager has to keep the

assistant manager informed ^{at} ~~of~~/alltimes. What does this say to you?" Why do

they have to write this into the bill? "Well," he said, "if you think that

the manager will be someone appointed from the Army ~~and the~~ and the assistant manager someone appointed from the Navy, then of course, since the Army and Navy are not willing to talk to each other, you very well have to write into the bill that "by God," this time they will talk to each other." There is no other explanation for this provision of the bill. Another law was introduced . A Committee on Atomic Energy was set up in the Senate. It had extensive hearings and later on a law introduced by McNamara was adopted and passed by both houses of Congress. The scientists tried to use the hearings before ~~the~~ the Atomic Energy Commission of the Senate for general education, both of the members of the Committee and the general public at large. One of the essential ^{points which we} ~~issues we~~ tried to get across to the Government on this occasion was our conviction that it will take Russia no more than perhaps five years to have the bomb. Much effort has been spent by those quite involved in the development to convince the government of the likelihood of an early development of bombs abroad. But those who were in high ^{administrative} ~~xxxxx~~ positions such as General Groves, Dr. Conant and Dr. Bush took the opposite view and the government as we now know accepted their views rather than ours. Thus, James Burns writes in his book Speaking Frankly, that when he became Secretary of ~~the~~ State, he tried to find out how long we may expect the Russians to take to produce a bomb

and from the best information which he could gather he concluded that it would take them from seven to fifteen years. This, Burns continues to say, was based either on the assumption that postwar recovery was fairly rapid and since postwar recovery itself was not rapid Burns thought that these estimates have to be ~~new~~ devised

~~ASSTANT SECRETARY~~ As we now know, Russia took four years to explode the first
~~in~~ bomb. This wrong appraisal of Russian capacity is probably responsible
for the fact that in our negotiations on the control of atomic energy we
took an inflexible stand. Many in our government believed what Churchill
so clearly expressed--- that the/atomic bomb by America is the best safe-
the also
~~guard~~ guard for/freedom of Europe. Since I believed that and/believed that
for many many years the Russians will have no bombs, there was no great
desire for inventing a form of control that might be acceptable to Russia
as well as the United States. (End of Record S16)

Now that the nucleus had been split, scientists began thinking in terms of using this vast energy as a source of power. A few, noting the war clouds over Europe, talked privately in terms of some kind of war weapon.

But one more question remained to be answered before such dreams could be practical. Was a chain reaction possible? In other words, would the neutrons given off when the nucleus was split go on and in turn strike other nuclei, causing further splitting and further release of energy.

The first report came from France. Frederick Joliot, son-in-law of Madam Curie, said he found that neutrons are given off, but instead of building up to a grand climax, the reaction runs down and stops like an unwound clock. For a time it appeared as if the hope of a new source of energy was lost.

Meanwhile, Dr. Fermi, now an American citizen, and myself, were working on the same problem at Columbia. We concluded after a series of experiments that a chain reaction could be sustained.

After others confirmed this belief, we felt the information ~~that~~^{so} important that it should be pointed out to the government, chiefly in view of the fact that there were indications that Germany might be preparing an ~~an~~ explosive on the basis of Dr. Hahn's outstanding work.

Dr. George B. Pegram, dean of physics at Columbia University, decided to send Dr. Fermi to Washington to lay our information before the Navy Department.

Fermi came back in a few days a very disappointed man. The Navy, he reported, merely said they were "interested" but after waiting several more weeks. nothing developed.

We, then, decided to approach the Army. A group of us went down to Washington to meet with a colonel in the Ordnance Department. Here the reception was even colder. No weapon, the colonel declared, can be said to be worthwhile until it has been tested in two wars. He dismissed us by saying that if we uncovered anything

like a death ray to come around and see him again.

Having been rebuffed twice by the armed services, the scientists were about ready to give up the whole idea and return to their laboratory work.

But with Germany ready to march into Poland, we determined to make one more try. The only man to reach, we decided, was the President of the United States, himself.

Albert Einstein, we believed, was important enough to get the President's ear. We journeyed over to Princeton, laid the matter before him. He agreed to write a letter which would be taken to the White House by Alexander Sachs, a Wall street friend of President Roosevelt.

Also sent along were some scientific articles and my own memorandum pointing out the possibility of using uranium to drive boats and airplanes.

Sachs presented the letter to the President on October 11. The text of it ~~follows~~ is attached.

In the spring of 1940, just before the Fall of France, Sachs again saw the President to present another Einstein letter dealing with the progress of German uranium work.

My own letter to the President suggested that a bomb set off at sea near the coast might produce tidal waves that would destroy coastal cities. I also mentioned the possibilities of a new poison gas, made of neutrons that might kill human beings within a radius of one kilometer.

Finally, the wheels began to turn. The President set up a special commission to meet with the scientists and discuss the problem further.