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GLENN T. SEABORG
Chairman, U.S. Atomic Energy Commission, 1961 - 1971

Appendix
Press Conferences

Lawrence Berkeley Laboratory
University of California

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Appendix
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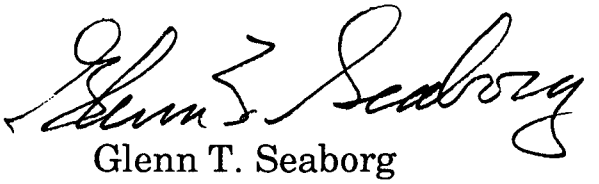
This book contains a very limited sampling of transcripts of press conferences held during my tenure as Chairman of the Atomic Energy Commission (1961-1971). This serves as an appendix to the *Journal of Glenn T. Seaborg, Chairman, U. S. Atomic Energy Commission, 1961-1971*, which has been printed by the Lawrence Berkeley Laboratory in 28 volumes, including three appendices. Each press conference is described (in a narrative fashion) in the entry for the day on which it happened. Copies of this daily journal have been deposited at the Lawrence Berkeley Laboratory, the Bancroft Library of the University of California at Berkeley, the Lawrence Livermore National Laboratory, the Los Alamos National Library, the University of California at Los Angeles Main Library, the University of California at Santa Barbara, the Hoover Institution at Stanford University, the National Archives, the Nuclear Regulatory Commission, the Department of Energy History Division, the Library of Congress, and the presidential libraries of Kennedy, Johnson, and Nixon.



Glenn T. Seaborg
June 1992
Berkeley, CA

TWX to Washington. 3/28/61.

From Charter Heslep to Duncan Clark. Copy to Howard Brown

Here are my notes on Seaborg's news conference at the Sherman Hotel, 6:30pm, Monday, March 27, 1961, immediately preceding his speech to the annual meeting of the National Science Teacher Association.

Those present included the Chicago Sun Times, AP, Chicago Tribune, Science World and a British reporter whose affiliation I did not get.

Question: What are your views on the resumption of nuclear weapons tests?
Seaborg: As you know, the negotiations are in progress at Geneva. I was called upon, among others, to give advice. I feel this would be a very bad time for me to take a position on this question.

Q. Are you planning any drastic changes at the AEC?
S. I was just sworn in on March first--a little over three weeks ago. The AEC is a going concern. There are five commissions. Three have been serving for some time. By law, the AEC operates as a commission. The Chairman has the same weight as the others. He has one vote. At no point is there discontinuity.

I think in the course of time there are certain areas I shall be looking at in concert with the other commissions. There is need to have a new look at the operation of some of our national laboratories to be sure they have an adequate mission and a well conceived and well planned program.

Going into more detail, I think there should be a little more emphasis on radioisotopes and their uses. In nuclear power, we may want to have a new look at ways of going forward. All of this is a continuing operation. There is no abrupt change.

Q. Are there some inadequacies in the laboratories?
S. After all, they have been operating a number of years and we want to be sure they have a mission. (Then Seaborg told of plans to visit and discuss their problems with the heads of the Livermore, Los Alamos Oak Ridge and Argonne national labs. He said he had been in office less

than a month but was on the job as an observer for a month preceding and he thought it was time to try and get around to see how the labs are doing.)

Q. As to isotopes, are you thinking of more research, more mongy?

S. I am thinking of a larger relative effort. I have no detailed suggestions

Q. Are you thinking of increased exports of isotopes?

S. Not particularly. I am thinking of our own program.

Q. There are reports of expansion of the Argonne National Laboratory. Will you comment?

S. I dont know if it should be spoken of as an expansion. A new particle accelerator is being built which will enable the laboratory to expand some programs.

Seaborg then described the accelerator, stressing that it was not as powerful as the 30Bev one at BNL or the one at Cern but that its unique feature would be the intensity of its beam.

Q. Have you given much thought to the relations of the AEC and foreign governments?

S. Yes. We are participating in the IAEA at Vienna, sponsored by the United Nation. I am carrying on the agreements and exchanges started by Chairman McCone and Professor Emelyanov, his opposite in the Soviet Union. You may recall that the McCone-Emelyanov agreement looked foward to the exchange of scientists and of reports and to the possibility of cooperative scientific projects. Only some aspects have gotten under way so far.

Q. What kind of cooperative projects?

S. One of the large cooperative projects in prospect is a large accelerator== possibly a joint U.S.- USSR and possibly involving other countries. This is an accelerator that would attempt to make the same money work for both countries.

Q. What would be the U.S. contribution in money and personnel?

S. The only investigation so far has been on a scientific basis as to what kind of accelerator should be built and discussion of if it is feasible. I have heard numbers as high as 300 bev.

Q. Would such an accelerator have anything to do with CERN.

S. No--not related. But not clear yet on form of coooeration. Other countries would be invited to use it but as conceived, it would be a joint US- USSR project.

Q. Can't the United States afford to build this new machine?

S. I am not saying that the McCone Emelyanov agreement envisaged this particular project. Either country could afford to do it but we might find that such a project would contribute to mutual understanding and to the lessening of international tension.

Q. Would we in the United States accept a site in the USSR?

S. I cannot prejudge where such an accelerator might be but it is more likely to be built in a neutral country.

Q. Why not take advantage of the site at Dubna?

S. This new accelerator would not be related to the one at Dubna, or at Brookhaven or any other. It would be a self sufficient project. If either country built it alone, it probably would not be at Dubna or at Brookhaven.

Q. By neutral country, do you limit this to Europe?

S. This is only in the exploratory stages. It has not gone beyond that. So far, the only discussion was by a group of U.S. and U.S.S.R. scientists at Brookhaven last fall on possible formation of a joint committee.

Q. Would such a project require approval of Congress and of appropriations.

S. Of course, but I repeat what has been done so far is only exploratory steps. We have not gone beyond that.

Q. Are you going to give up your work with the Chemical Material Study Group?

S. No, this is one of the few things that I am going to continue. The

need for an adequate education system is so important that I intend to lend some help where I can.

Q. Has the chemistry group benefited from the work of the PSSC?

S. Oh yes. It has shown the value of bringing the high school teacher into the process of developing new texts, experiments, laboratory manuals and teachers' guides.

Q. What levels of the high school population are you trying to reach.

S. All levels. We are aiming at the entire chemistry class. This was one of the most important early decisions we had to make.

Q. Can you give us some guidance on what such an international accelerator would do?

S. Literally, we do not know. (He cited the Lawrence story of planning the Bevatron). We just do not know what we would find. We can expect to find some new laws of nature, to gain new insights as to the forces that hold the nucleus together, perhaps to find some more subatomic particles.

End notes. Conference broke up at 6;55 and WGN-TV then video-taped about 1¼ minutes. I was out in hall emphasizing exploratory nature of the U.S.-U.S.S.R. talks and that the joint meeting last fall was not a government sponsored one but just the scientists themselves talking things over. Understand WGN asked the "Any radical Changes" question and a question about the role of the laboratories.

Heslep.

Press Briefing in Vienna on Friday, Sept 29 at Imperial Hotel.

Harry Kendall opened the meeting by citing ground rules.

1. McCabe, UPI - Anything of general nature concerning conference up to now? Particularly with regard to D/G?

GTS: Very interesting and useful so far. The Agency seems to be coming of age. Making progress in scientific areas. In answer to your second question on the D/G, frankly I dont know.

2. Nucleonics - Future of the Agency? Soviet remarks?

GTS: Prof Emelyanov made some constructive suggestions. I was struck particularly by his suggestion that the Agency help developing countries by giving them radioactive isotopes for hospitals and basic research. I am not sure but there are indications that Soviets will support the agency.

Nucleonics again - Emelyanov repeatedly spoke against waste disposal.

GTS: There must be some misunderstanding. Emelyanov and I have corresponded. There is alos underway a study on waste disposal in the sea. I think mainly we need here information on what the Soviets are doing. They have Pu producing plants. What we need is an exchange of information.

3. NY POST - What about Emelyanov speech?

GTS: I have had many talks with him. Have been quite friendly. He seems particularly happy to talk, as he puts it, with another scientist.

4; GERMAN - How about the McCone/Emelyanov agreement. Any recent developments?

GTS: There have been some results. 4 or 5 days after I took office on March 1 - On March 5, I believe, I wrote Emelyanov stating we should implement this agreement. Hoped for exchange of scientific information and visits of scientists - waste disposal - fast reactors. He responded and indicated he was sending along hundreds of Soviet reports and we sent a number of our reports. Actually I had indicated abstracts might be sufficient but in many cases he sent complete reports. Visits are being further discussed. There were immediate exchanges right after the agreement was signed.

McCone went to Russian - Soviet scientists came over here. I think it is coming along fairly well.

GERMAN again: Have you received their reports?

GTS: We have received hundreds of reports. I cannot recall how many were complete.

5: unknown: Were they new information or something you knew about?

GTS: We knew about some but many were about new or additional subjects or more advanced reports. They were all uncleassified of course.

6: OSLO - On the NS SAVANNAH. When will SAVANNAH appear in European waters?

GTS: SAVANNAH is a trail blazer for establishing precedents before nuclear ships can sail in international waters and put into ports around the world. Many questions of international law need to be answered. Ship must also be technically proven. Engines must be brought up slowly and then proven out. Probably take at least a year.

OSLO again: Could it take longer?

GTS: Very difficult to estimate. In time I feel these ships will be acceptable.

7: HANDLER NY TIMES: Will you speak again? In this conference in response to Emelyanov?

GTS: I am planning not to make a statement.

8; OSLO - Can you give us some more information on radioactive waste disposal? Is it not a political question?

GTS: I have spoken twice on this, first on waste disposal in the sea - also on radioative isotopes to developing countries. Is your question on one of these two points? If so I am willing to respond. (no answer).

9: NUCLEONICS - Does US pay greater share of IAEA funds?

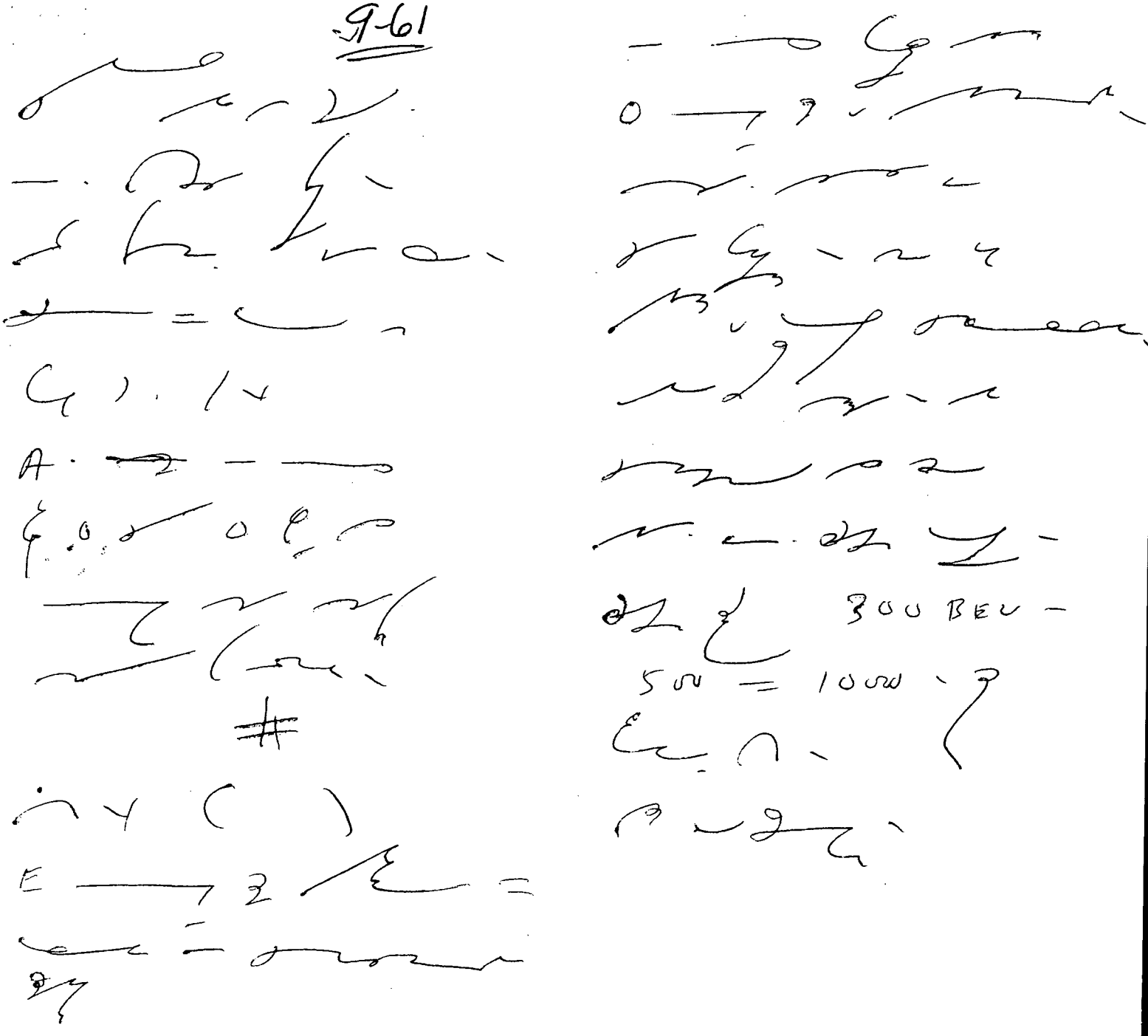
GTS: I would like to see costs of technical assistance in a more definite category. I visited the IAEA lab at Seibersdorf and was impressed by their work and by their international team. I would like to see the funding in a definite budget - at the beginning of the year.

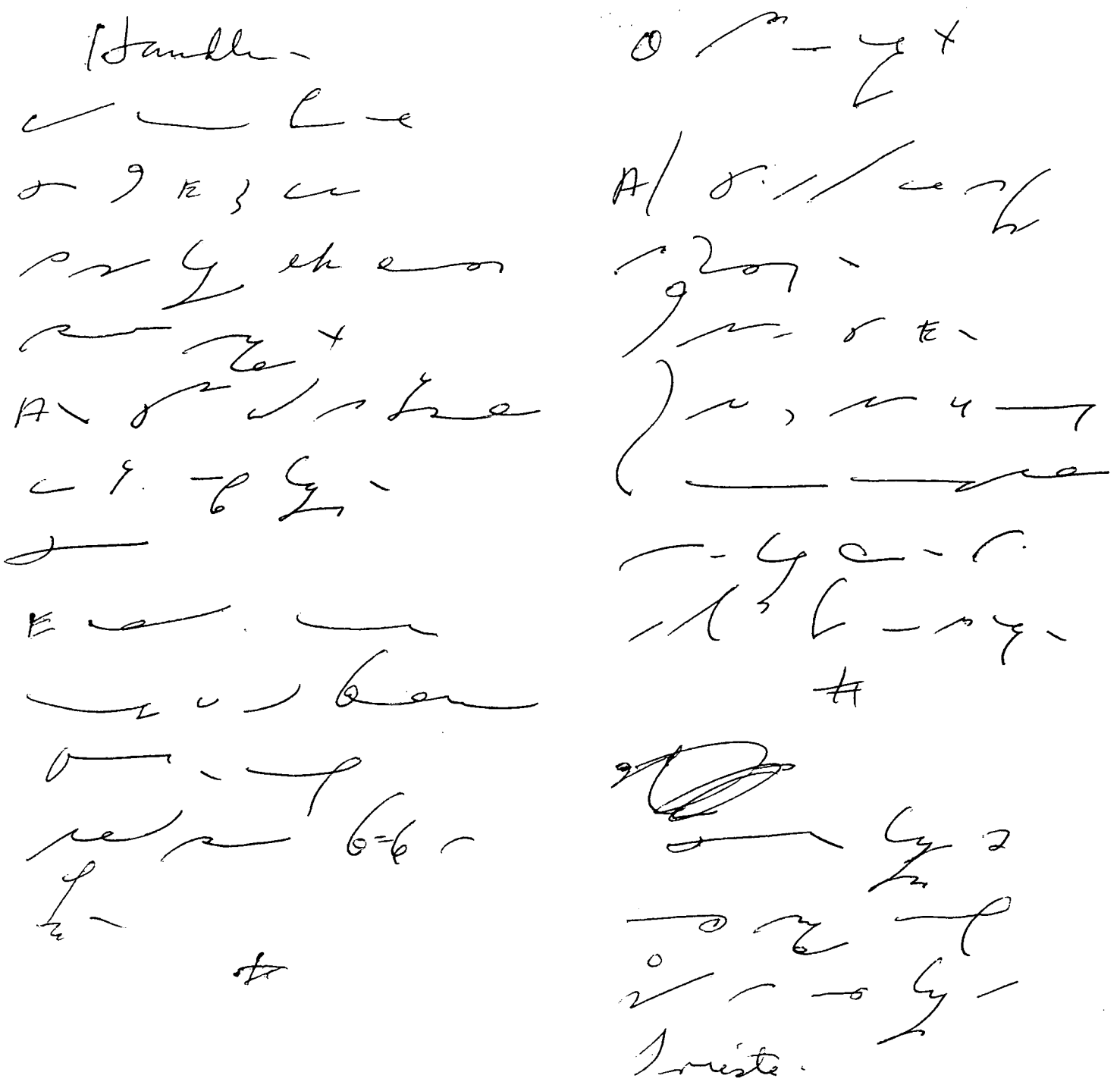
6

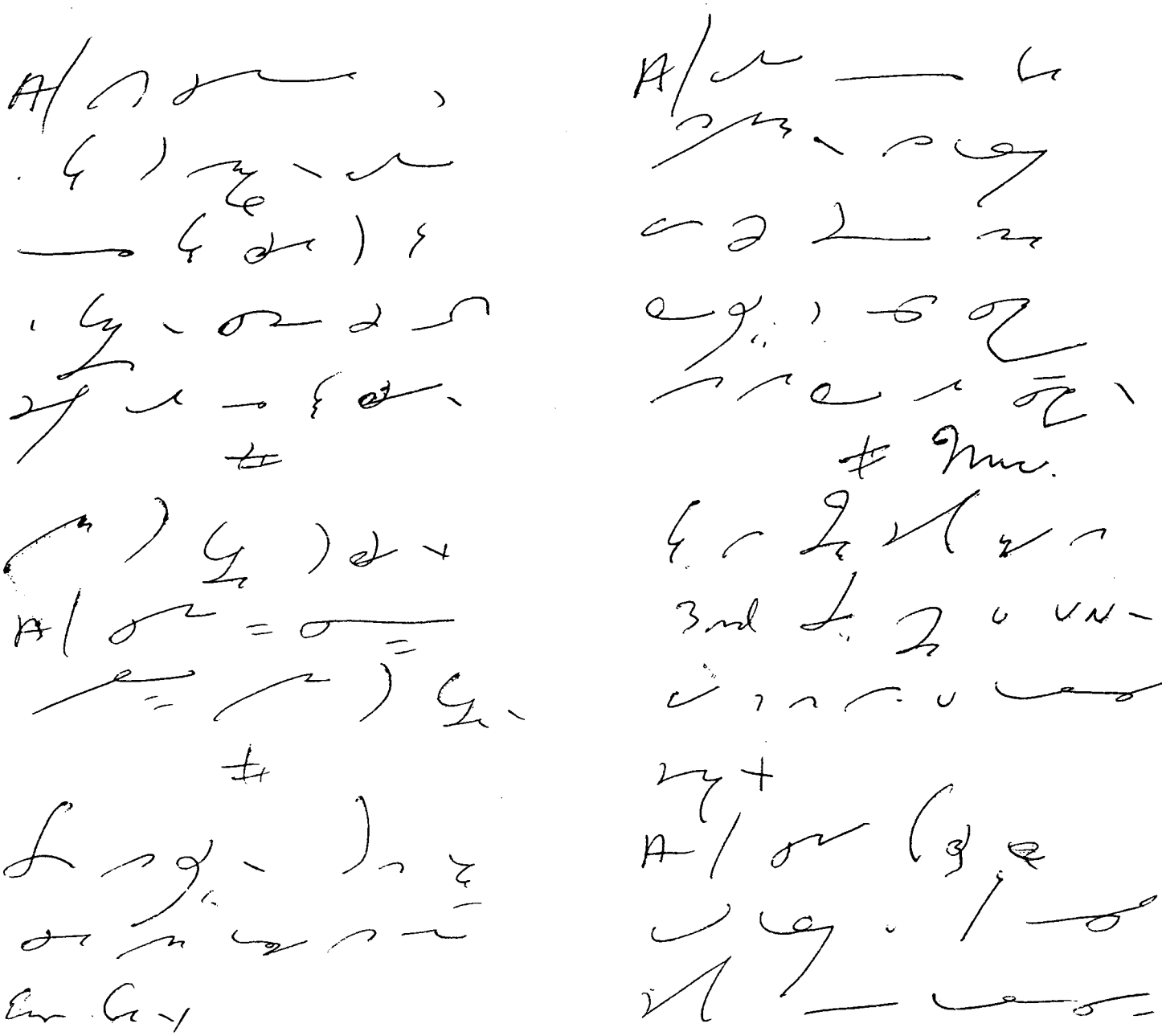
NUCLEONICS again: Will you press for a change?

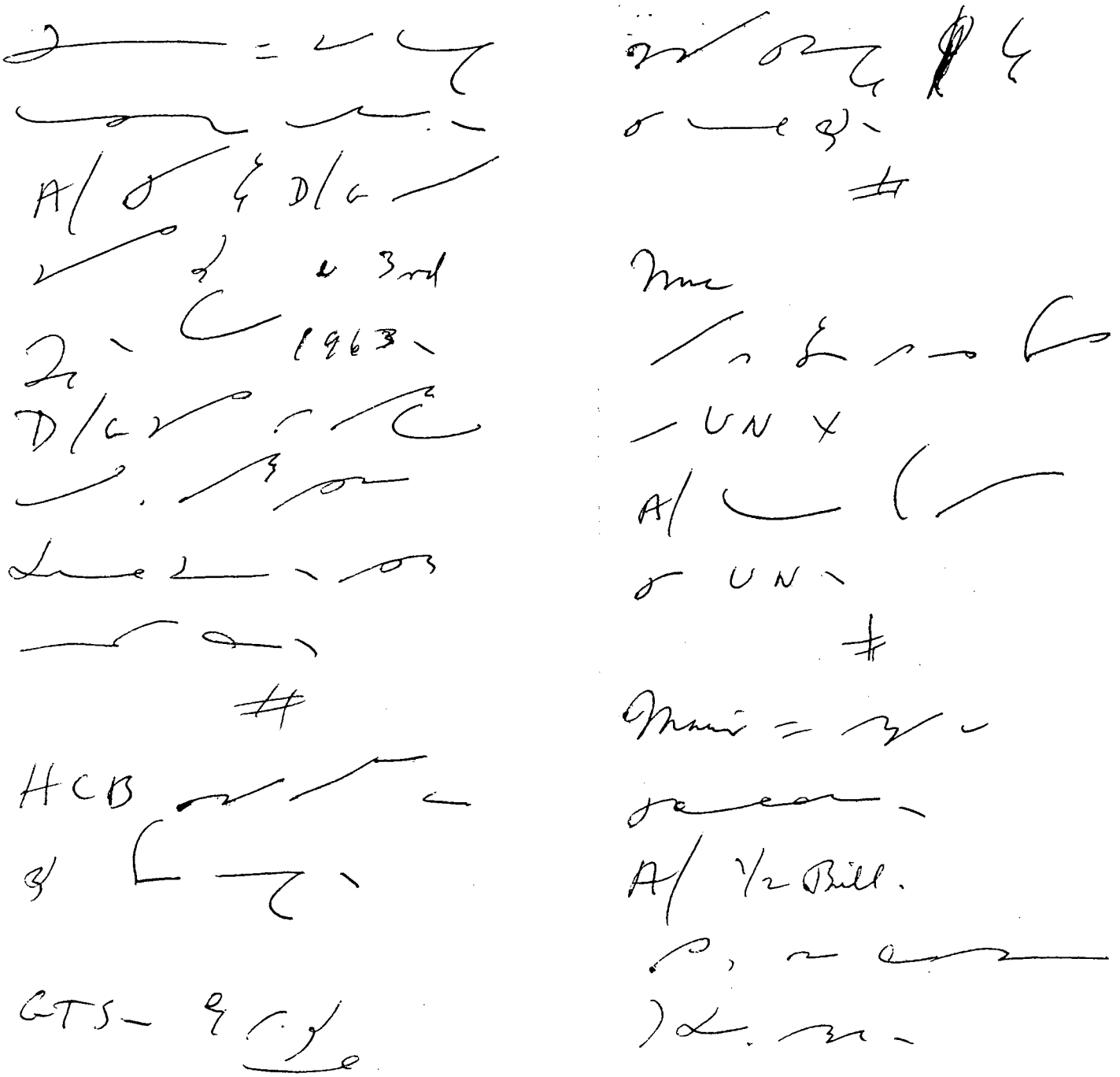
GTS: In my speech I said I hoped that Member Countries contributions could be increased.

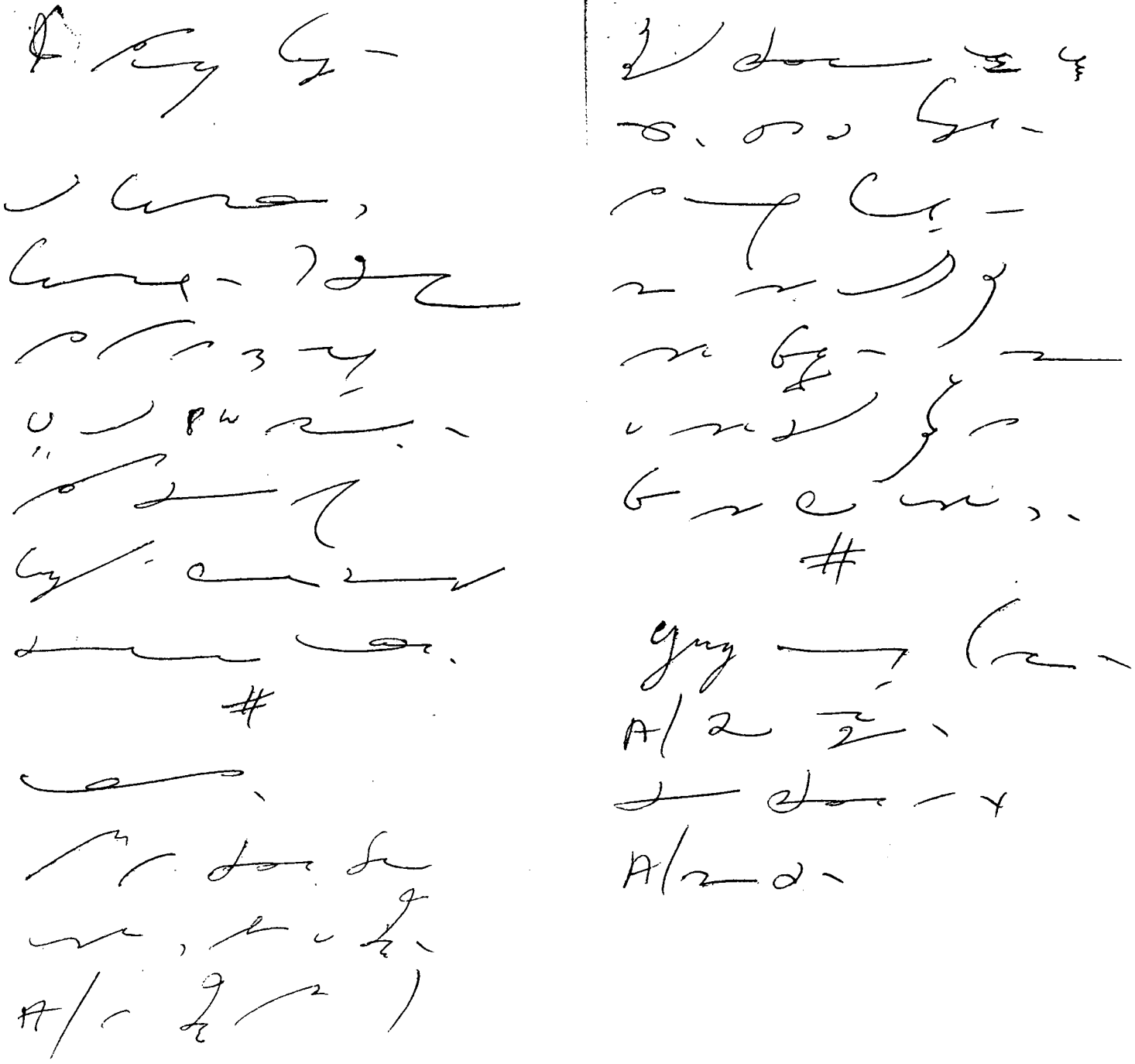
10. (unknown) Prof Emelyanov mentioned waste disposal











10/24/61 ①

TRANSCRIPT OF PRESS CONFERENCE
HELD WITH
DOCTOR GLENN T. SEABORG
AT THE
INTERNATIONAL SYMPOSIUM ON AERO-
SPACE NUCLEAR PROPULSION -
OCTOBER 24, 1961

Q. Russ Hawkes, Aviation Week:

Some of us heard that you were going to make a major policy announcement here and I have just paged through a copy of your speech rapidly I can't find it. I wonder if you would point it out to me?

A. I don't think there is anything in this speech that would fall in that category unless it is my prediction as to the type of reactor that we might go to in the future in order to get the high power, i.e. hundreds of kilowatts or megawatt reactor for utilization in satellites in the SNAP program. That is the lithium cooled fast neutron reactor that I referred to towards the end of the speech. That is the only thing that I could think of that would be in that category - that is only a prediction.

Q. How long would it actually be do you think before we have a workable nuclear power space craft? You mention testing of the upper stage in 1966?

A. 1966-67 - I have been saying at the end of this decade, speaking very roughly. It will depend, of course, on the priorities - on the degree of urgency that is attached to the program as it develops, and if it gives indication of developing successfully and the rest of the space program seems to be developing successfully in requiring it, then the urgency could increase and perhaps we could beat that time.

Q. Gladwin Hill, New York Times:

To what extent could the Rover and Pluto programs be speeded up with more money?

A. Well, I think they could be speeded up to an appreciable degree with more money.

Q. What does that mean - like knock a year off the time schedule?

A. It is very difficult to gauge it in terms of the overall schedule but something like that perhaps to the final operable vehicle.

Q. Are you satisfied with the funding now?

A. Well, I think that at the present time we have just what we have asked for, and I am satisfied but in the future it seems to me that the funding can make the difference certainly in the time scale-something in the order of a year. These are just rough though, very rough figures, and in some ways the degree of urgency, the psychological factors will be just as important. The urgency that is attached to the project will determine in the long run what scientists are on it and how they work and how they get the materials and so forth, but obviously we have to have a certain minimum of funding in order to make the time schedules.

Q. Bob Adamson, Nucleonics:

Could you give us some ideas of what you expect in Fiscal '63 for these respective programs in terms of percentage increase - these two programs, the rocket and the ramjets.

A. The rocket and the ramjet? Well, on the rocket (Rover) I think the increase is something like 50% that is being contemplated. Of course, we don't have that for '63 yet and I think a larger proportion of that begins to come in NASA rather than the AEC as we begin to get into hardware. Ramjet - we can't say at this time - the future hasn't really been determined. You are talking about the Pluto project?

Q. Dr. do you have a scheduled date when construction is suppose to begin on the RIFT reactor?

A. I don't think so.

Q. Could you tell me when the final development contract is supposed to be let?

A. The RIFT reactor is that the other term for the NERVA?

Q. That is the reactor in-flight test?

A. Yes, that is the NERVA engine, the RIFT reactor. What is your question?

Q. I wanted to know a scheduled date on it, when construction will start?

A. The present contract with the Aerojet - General-Westinghous combine is for six months from the date of the contract which was a couple of months ago, and then if things go well with that team then the contract would be renewed contemplating the construction of the engine. I don't know that we can say there is a schedule date at this time - their assignment would be to construct it as soon as possible and the date would depend a great deal on the result of the forthcoming tests - KIWI tests, particularly the test that is now scheduled for next spring using liquid hydrogen. The tests so far as you probably know have been using gaseous hydrogen, so it would be hard to suggest a construction date at this time. It would be tied very much on the results of those tests.

Q. Marvin Miles, Los Angeles Times:

I hope I am not impertinent but I should like to know if you can discuss or will discuss for us the realm of a possibility of resuming nuclear atmospheric weapons testing?

A. Well, I will try to answer any questions that are put to me - I wouldn't limit the conference to questions on nuclear energy in space.

Q. Can you give us an idea of what it would take and what it would mean and how soon this conceivably could be done?

A. Well, if the decision were taken to resume testing in the atmosphere, it could be done very quickly - in a matter of weeks and I say if the decision

were taken.

Q. Would this mean testing both here and in the Pacific as well?

A. It is possible totest in both places. Obviously a decision of that sort hasn't been made yet, so I honestly don't know the answer to that question.

Q. The subsurface tests that are being run out here are they being detonated in the tunnels that were constructed in the Plowshare program?

A. No, I don't think you could say that these tunnels were constructed for the Plowshare program. If you recall there was a tunnel system that was constructed back in 1958 and a year or so preceding that for the underground weapons testing program in 1958 - the so called Hardtack series, and that tunnel system still had sites left in it. That tunnel system was turned over in large part, at least in theory, to the Vela program during the years of the moratorium and it was contemplated that this seismic detection program would use a number of these sites during that period. With the resumption of the underground nuclear weapons testing this tunnel system was utilized in the shape that we found it at that time, so it really wasn't a system that you might say was planned for the Plowshare program. Some of the Plowshare work was planned to take place there, but the tunnel system wasn't to be devoted to that.

Q. Would it be true, that what controls when you start making your first tests above ground will be when you run out of tunnels?

A. Oh no, I think that would be an oversimplification. We have quite a number of tunnels but I don't know how you define a tunnel site for underground nuclear explosions. We are in the process of building others.

Q. Ray Enderle, Wall Street Journal:

Could you tell me, sir, whether there is any planned program, if the

decision were taken, on how long our series of test would run, approximately? Are any number of tests atmospheric?

A. No there isn't at this time.

Q. Could you tell me then how far ahead do you think the Russians have moved on us with their tests.

A. It is very difficult to speak in terms of how far ahead one nation is as compared to the other. I don't think they are ahead insofar as this term has any meaning at all. I have implied, I don't think it has too much.

Q. Victor DeBiasi, Space Aeronautics:

Proposals have been made to propel space vehicles through a series of controlled nuclear explosions.

A. Yes .

Q. Do the nature of such explosions differ very much from those for weapon explosions?

A. No, this is the so called Orion experiment.

Q. Yes, so in the event we agree to discontinue nuclear testing -

A. No, it depends on what you mean of the nature of it - they do work in terms of trying to direct the explosion more, but basically the nature of the explosion is the same.

Q. Well put it another way - if we agree to discontinue testing in the atmosphere, would this mean we would abandon the Orion concept?

A. Yes, if we had signed an agreement that we weren't going to test in the atmosphere. Let me put it this way - if we weren't going to test above ground you would almost have to abandon the Orion concept. You might raise the technical question of whether testing beyond the atmosphere, which is one of the chief places where you would want to make the test for Orion so that one could contemplate the situation whereby we continued not to test

in the atmosphere, but tested above the atmosphere and proceeded with the Orion experiment.

Q. Do you feel that there is any reason for testing giant thermo-nuclear weapons such as Russia is doing. I have been told that you can get the same results from a much lesser yield and not have to build the big one - in other words you can be sure it would work.

A. I can answer that categorically. I think that there is no reason for testing a weapon like the one that the Russians either have tested or are contemplating testing in the region of these very high energies like 50 megatons. The test that you need to make and which would be entirely adequate can be carried on in a range of yield where the Russians have already tested.

Q. Do you think, sir, it would be mostly for propaganda that they would be detonating such high explosives?

A. Well certainly it would have to be for reasons other then the technical need for the experiment.

Q. In your banquet talk you seem to be saying, maybe you are saying - I don't know - that the Commission is already on its policy or requirements. NASA or the Pentagon would have to come to the Commission and say "we need such and such a reactor for space such as 300 kilowatts. Are you saying that you are no longer waiting for those requirements - that you would go ahead to meet forseeable space power needs?

A. I am trying to inject a little urgency into the need for overall planning, and it could ever require more funds earlier than we had anticipated. I have begun to have the concern - and I have no reason to believe that the final outcome would be unsatisfactory in that we won't do it the way I suggest - I'm quite sure we will - but I have begun to have some concern that everyone involved should understand the need for having all of the

things here come out even - the capacity to be ready at the same time. The capacity to launch the large vehicle, the complicated electronic gear that must be present in the vehicle, and the large power sources that will be needed to operate - for example, in the case of the advanced communications satellites and so forth. I just want to be sure that these all come out even at the same time and it seemed like this was a good point to make in this talk. I don't anticipate any difficulties in this.

Q. In the funding area you are missing your biggest point.

A. This will require more funding then some people perhaps are thinking about it at this time. I probably wouldn't have been saying it other than it was a speech in which I felt I was compelled to make a few interesting points, and that was one of them.

Q. How much more money do you want, than you are getting now on the SNAP program?

A. This has to do with the budgets for the future that haven't been determined. We don't have any requirements, any real requirements beyond the funding that has been made up to the present time, in other words the '62 budget is adequate. I am just talking about '63, '64, '65 and '66. It may be that the SNAP end of this will have to have more support, let me say than some people perhaps thought. We haven't reached the point yet where anybody has disagreed with this.

Q. I was wondering how much is being spent on the SNAP program right now?

A. Somebody said I should give a "snap" judgement on that? In Fiscal '62 - do you know that figure? (Dr. Fritch). What is the SNAP budge in Fiscal '62? (Dr. Fritch - in Fiscal '62 about 40 million.)

Q. Dr., up until this summer the only restriction on press access to the proving ground out there was on a basis of security where arose - we now have a band on entry there that is obviously based on policy rather than on security. Are you in favor of this and how long is it going to go on?

A. Well, I think its based on security as well - I'm in favor of it. The reasons for it are rather simple and straight forward. For one thing it makes it possible to carry on the work in a more straight forward manner. The tests are underground where the things to be seen are minimal.

Q. That simplifies the security end of it?

A. That simplifies thesecurity angle. As long as the tests were above ground there was a great need, an obvious need, in fact, a responsibility to inform rather generally, certainly the people in the neighborhood, for that matter all of the people in the country. This was necessary as long as there was testing in the atmosphere because this effected so many people and this, of course, would be necessary again if we resume testing in the atmosphere. Now with testing underground we feel that this is only one part of the whole nuclear weapons development program. There has never been any question before about the need for secrecy in the whole weapons development program up to the testing point. Probably the whole weapons program would have been carried on under secrecy through the testing phase if we had started testing underground, i.e., there hadn't been a need for public disclosure which was introduced by atmospheric testing. So I think it is in the best interest of insuring maximumprogress, and most compatible with our national security to carry it on this way.

Q. Do you think the public right to information which is the principle of this nation is a function of altitude. Whether you are setting something

out a few feet under some dirt or a few feet over some dirt? Isn't the publics' right to information an invariable principle?

A. I don't think that the publics' right to information is an issue here, that was the point that I was trying to make. The whole weapons development from conception in the minds of the scientists through what you might call bench-work and design in the laboratory up to the test point has never been an issue of the need to disclose this to the public and I think everyone understands that. We couldn't possibly operate under those conditions. All I am saying is that this is the last step in this whole development program and it probably would never have been disclosed had we started testing underground. It is because of the need that was introduced when we were testing in the atmosphere that the public disclosure was made. In the whole area of weapons development, including non-nuclear weapons development, there is no policy of public disclosure of the development as it proceeds. I don't think there is any such issue here at all.

Q. Then you don't think the press should have been admitted to the previous underground tests, i.e. to the Hardtack tests? You think that was a mistake?

A. No I don't think that was a mistake, I think that when you went directly from a situation where you were having atmospheric testing to underground or to a combination of the two and had a pattern set up that it was a very natural thing to do to continue that pattern, but it certainly was also natural to re-evaluate that three years later when we were faced with a new situation.

Q. Getting back to our flight program, what would you say is the next step beyond Rover, Pluto and Nerva? The next step in experiment, design and flight test?

A. Well I would say that after we have an experimental engine developed through Nerva, it would be the flight test which we have anticipated might come in '66, '67 and then I suppose a rescoping on the basis of what we learn from that, then the beginning of the manufacturing of the devices.

Q. Well wouldn't we have to stop work on advanced designs right now to follow - on beyond?

A. Well insofar as we can on the basis of what we know. I consider the KIWI tests next spring, with nuclear reactor and the liquid hydrogen as a sort of crucial point that will give us the sort of information that we need before we can begin to commit ourselves to hardware. It can be very wasteful to commit yourself to expensive hardware before you know what you are building and it is just a matter of drawing the right line between having a sufficient amount of information so that we can begin building in the hardware stage and not waiting so long, unecessarily long, so that you delay the project and don't get there at the earliest possible time.

Q. Dr., can you spend a few minutes just discussing the technical problems that liquid hydrogen will introduce?

A. Well the problem of the nozzle is one of the most difficult problems - whether the nozzle will hold up in this combination process of introducing the liquid hydrogen around it which gasifies and cools it on the outside and to have the colder gaseous hydrogen go through the reactor. Then the problem of whether the fuel elements will hold up at this high temperature as they heat the gaseous hydrogen to the high temperature and then the problem of the nozzle again as the very hot hydrogen goes out through the

nozzle at the high speeds and high temperatures that we want. I would say they are basically materials problems. The fuel elements, the nozzles and the pumping of the hydrogen in the vehicle. I would say those and the control of the reactor are basically the problems.

Q. Dr., is the Rover project classified now?

A. Yes.

Q. When was that classification put in?

A. I think so far as the development of the reactor itself is concerned it was born classified. I mean it has always been classified.

Q. It was our understanding it was unclassified - until this summer we were going out there regularly.

A. Well I think it depends on what you mean now by classified. I took you to mean the reactor itself; the temperatures in which it operates, the constitution of the fuel elements and so forth.

Q. No sir, I meant the project overall activity.

A. To go out and look at the test is no longer possible. It is classified in that sense and that is purely and simply a matter of logistics - the location of the reactor and where the reactor is located on the test site. Therefore, because the nuclear testing is going on in that region we thought it was in the best interest of national security to no longer permit the unclassified visits to the Rover site.

Q. Bob Brown, Review-Journal:

Are there any long range plans which can turn the test site into a possible launching site as time progress?

A. For Rover?

Q. Yes for Rover, or for Pluto.

A. No I wouldn't think so - I don't like to make snap judgements but I think that these would be launched either from a site off shore, or on shore along the ocean or perhaps even from an island way out in the middle of the ocean with a couple of thousand miles of water in every direction. I am pretty sure that the launchings will be from sites that meet those criteria first.

Q. In connection with the resumption of atmospheric tests, if that decision is made, what would be the facts in determining whether the tests are here or possibly in the Pacific?

A. Well, if I could reduce it to its basic elements I think it would be where we could make the quickest progress with the least hazard to people.

Q. If we are not now behind the Russians in nuclear weapons testing will we be if we continue to test underground and they continue to test in the atmosphere?

A. Oh you mean that if they tested indefinitely in the atmosphere and we tested forever underground? Oh yes, there would come a time when we would have to say that we are behind. Particularly in testing weapons, the effects of weapons, the anti ICBM, and so forth.

Q. How long will this take doctor? A matter of years?

A. I don't think I should try to estimate that.

Q. Dr., I would like to ask you a double barreled question if I may. Your answer before on not having a need for testing to exhorbitant yields, does this mean that we would contemplate no such massive explosions? Secondly, what is your optimism or pessimism, if you care to state it, on the possibility of achieving a test treaty?

A. I don't know - trying to respond to the last question first - how much room there is for optimism. I would like to say that personally I hope we could

achieve a treaty and I think we should keep trying. I think I would rather just confine my anser to that. Now your first question.. I am not sure that I understand it.

Q. In view of the fact that you said you agreed there is no need in developing a huge bomb; that there is no need to test beyond the levels that the Russians have already tested, excluding this last test and does this indicate we will never contemplate any tremendous explosions in the future beyond what we have already detonated in size?

A. Well I hesitate to answer that precisely. You ask do we contemplate such an explosion and the answer would be no, we do not contemplate making explosions that large. Now if I may speak as a scientist when you say that in time - in the future - who knows, but I do want to emphasise that we do not contemplate at this time any such thing.

Q. Miss Borders, U.P.I:

Dr., have we conducted any smaller tests that would prove in your mind that we are capable of exploding a bomb the size Russia detonated yesterday?

A. Oh yes, we could build such a bomb, I am almost tempted to say rather easily, if I could use such a term in such a terrible field. We could build such a weapon quite readily - there is not doubt about that whatsoever.

Q. The Atomic Energy Commission was quite regularily announcing those tests that the Russians made in the atmosphere until we got to about 20. At that time President Kennedy at a press conference said "well there have been more but we haven't announced all of them because we didn't want to endanger certain of our detecting methods". Could you say generally how many more are there - more unannounced Russian tests that have been made that haven't been announced?

A. No I couldn't estimate that for you.

Q. Would that hold true in our case? There have been 3 announced U.S. underground tests. Would you say there have been more unannounced then announced?

A. No I am sorry I couldn't answer that.

Q. There are beginning to be some indications that possibly your having to go to Livermore for ramjet people and Los Alamos for rocket people could help with your resumption of weapons work with the consequent possibility of delaying those two non weapons type testing?

A. The danger of transferring people from Rover and Pluto to the testing on the scientific level. It's our policy to not do this and if there has been some it hasn't come to my attention. There have been transfers of personnel from other works that I have been going into quite carefully in recent weeks, in fact I was out to talk to the Livermore people over the weekend and yesterday, all day, at the test site. We are certainly looking into all the possibilities of making personnel shifts in order to increase our rate of progress in the nuclear weapons testing area. But it is definitely our policy - very strongly our policy - not to shift them from Rover, particularly Rover, and essentially the same policy for Pluto. We are very anxious that Rover stays on schedule and/or that we can beat the schedule if possible. This is very important.

11-9-61 for 11-21-61

WGM PUBLIC AFFAIRS IN COOPERATION WITH NORTHWESTERN UNIVERSITY PRESENTS - "YOUR RIGHT TO SAY IT" - (Now in its fifth year on TV)

Tonight "A LOOK AT THE WORLD OF NUCLEAR COMPETITION"

On November 1, 1952, the United States made the first successful hydrogen bomb on Eniwetok atoll in the Pacific. The blast shown here is equal to eight megatons of TNT. Russia began its H-bomb testing in August of the following year. Since that time over 240 such bombs have been exploded by the Nations of the world, culminating in 31 recently announced Soviet tests. The mos spectacular of these was the October 30th blast estimated at a power of over 50 megatons. The resulting nuclear fall-out has created worldwide fear and fostered a resolution in the United Nations nuclear testing Assembly asking an end to all testing.

Now here is moderator James H. McBernie (sp?), Dean of the School of Speech at Northwestern University,

McB: Good evening. Tonight we discuss the problems and the responsibility imposed upon us by Russia's recent nuclear tests. There is probably no man in America better equipped and better placed to answer our questions than our guest here tonight. We are honored to present - Dr. Glenn T. Seaborg, a distinguished chemist, a Nobel prize winner, a key figure in the development of the atom bomb, and now Chairman of the Atomic Energy Commission. To question Dr. Seaborg we present -

(more)

Robert E. Kennedy, Chief Editorial Writer for the CHICAGO SUN-TIMES

John H. Thompson, Military Editor of the CHICAGO TRIBUNE and news commentator for WGN television.

We will begin the discussion in ~~xx~~ just a moment.

(commercial)

Mr. Kennedy has the first question for our guest.

Mr. Kennedy: Dr. Seaborg, a recent edition of TIME Magazine - the one with your picture on the cover - said that one of your big jobs now is - and I quote - "to prepare the ~~xx~~ United States for renewed testing." Now, since the President has said - has given the impression - that we have not definitely made up our minds to renew testing. Is this a fair statement or just what does that mean?

Dr. Seaborg: Well, President Kennedy has announced now on several occasions that he wants the United States to make the necessary preparations for atmospheric testing so that we will be ready in case the decision is made to test in the atmosphere. This takes some time. It has a certain lead time associated with it. And it is in connection with making those preparations that presumably is that statement in TIME/~~xxx~~ made.

Mr. Kennedy: You have to find locations and have to get material and ~~personnel~~ personnel together.

Dr. Seaborg: Exactly.

(more)

Mr. Kennedy: That doesn't mean, for example, as some might think, that it is to prepare the United States citizens psychologically for resumption of atomospheric tests?

Dr. Seaborg: Well, no; that is not implied in this case.

Mr. Kennedy: No. Well, you say, when we make our decision to - whether we will resume testing, that will depend on what we find - what scientists, such as yourself, find from the analysis of the Russian fall-out? Is that the basis on which we will figure it ---

Dr. Seaborg: Yes. President Kennedy has indicated that he will be guided, really entirely, on the basis of the necessity, the need, in terms of our Nation's security, to resume testing and, in order to make that evaluation, he will be guided, in large part, by the progress the Russians have made in their testing.

Mr. Kennedy: Now, don't we have a number of devices that we would like to test, that we have had in the blue print stage, in the laboratory stage that we could test anyway, regardless of what the analysis of the Russian fallout shows?

Dr. Seaborg: Yes, sir. But the President takes this step of going into the atmosphere so seriously that he wants to weight all of the factors. I said this is one of the factors by which he would be guided.

(more)

Mr. Kennedy: Assuming, Dr. Seaborg, that we will resume testing in the atmosphere, which is, of course, a Presidential decision, but assuming we do is, when could we begin - ~~xxxxxxxxxx~~/ six months, mid-summer----

Dr. Seaborg: I don't feel that I can give you an estimate on that.

Mr. Kennedy: Not possible. In going back into the atmosphere, to test - what will we be testing at that time? What will ~~xx~~ ~~xxxxxxxxxxxxxxxxxxxx~~ we be testing at that time - new weapons, or perhaps an anti-missile, missile?

Dr. Seaborg: Well, there are cretain things you can't do underground, that must be done in the atmosphere. One of these is obviously the effects of weapons on weapons in the atmosphere; you can't do that underground. You also can't proof test large weapons that are in the stockpile but have never been tested that have been developed and built during the moratorium on testing. You also can't test complete systems of weapons, i.e., the combination of the missile and the warhead, to find whether it is operational. Obviously, you can't do that ~~xxxxxxx~~ underground. And then, also, the progress for all kinds of testing is slower underground than in the atmosphere.

Mr. Kennedy: Would we be able to test a neutron bomb - supposing that the scientists ever achieved that.

(more)

Dr. Seaborg: I might amplify my previous answer a little bit. However, there are some tests that can be made better underground than in the atmosphere. It isn't all one way.

Mr. Kennedy: A neutron bomb would not be one of those, if we ever reached that point, I presume.

Dr. Seaborg: That needs to be tested----

Mr. Kennedy: Underground---

Dr. Seaborg: Underground, Mister, or ----

Mr. Kennedy: It would have to be tested in the atmosphere, I presume.

Dr. Seaborg: Well, my only response to that would be to say that we are making all of the improvments in our weapons that seem possible.

Mr. Kennedy: Along that same line, there has been so much talk about this neutron bomb. If that is ever developed, is that an ultimate weapon? Or is that another merely for use in battle?

Dr. Seaborg: I don't feel that I am in a position to comment on the details of a particular kind of weapon.

Mr. Kennedy: Dr. Seaborg, in this connection I read somewhere that one of the things that the scientists are analyzing - and I have no idea what this means - I am only throwing it to you and have you explain it to us in our terms. In their analyzing trying to find out the level of neutron flux, would that have something to do with the possibility that the Russians have develop a neutron bomb?

(more)

Dr. Seaborg: The level of neutron flux.

Mr. Kennedy: The level of neutron flux.

Dr. Seaborg: The level of neutron flux. I don't know exactly what is meant by that XXXXXX term. The nuclear weapons emit neutrons when they explode and they emit neutrons in about exact proportionality to the size size of the explosion. So I suppose this is one way of making an assessment as to what kind of weapon you have. I have never heard the term used exactly that way for this purpose.

Mr. Kennedy: Doctor, do you think the Russians have made any significant advances by their recent atmospheric tests, or would you know?

Dr. Seaborg: Well, we have not finished analyzing the Russian tests yet so I wouldn't really know, at this time.

Mr. Kennedy: In other words, they weren't conducting these tests for----to instill fear for propaganda purposes? These were real fabric---

Dr. Seaborg: Th I think they had a number of motives. One of them, I believe, was obviously the political or the Psychological motive. But I think also that they had technical reasons to make a number of these tests--proof tests of weapons. I believe test some weapons systems of the type I mentioned. Also probably to reduce the weight of some of their intercontinental ballistic missiles. And also to improve their tactical weapons and probably to study the effects of weapons on weapons. All of these things; these are

(more)

These are more or less obvious. I don't have any information - inside information; I don't arrive at these conclusions as a result of the analysis of the Russian tests. These are just obvious objectives.

Mr. Kennedy: Well, do you think the Russians have been working on these tests preparing for them all thru this three-year moratorium?

Dr. Seaborg: I don't know that they have been working all through the three years of the moratorium but it is clear that for a substantial part of the time while they had representatives at Geneva negotiating with us in what we thought was good faith, they were actually preparing for these tests. It is difficult to estimate how long they have been preparing because this depends on how much information they are getting out of the tests, how much diagnostic information. It is possible to explode a number of bombs in quick succession just for the "bangs" and get a minimum of diagnostic information. At the other extreme it is -- one might have as an aim, and this tends to be the policy of the United States, to get ever single bit of diagnostic information out of every test that is possible. I don't believe Russia had been at that extreme, of getting -- of milking all of the information possible out of it. They're is somewhere in between and their position in that spectrum would determine how long they have been preparing.

(more)

Mr. Kennedy: In your evaluation of the Russian tests so far, have you been able to determine just how dirty was their 50/megaton/ plus bomb, with people talking these days of dirty bombs and clean bombs.

Dr. Seaborg: We don't have that information yet.

Mr. Kennedy: That has not arrived--

Mr. Thompson: Speaking of dirty bombs, there seems to be a change of opinion, at least I think the public is given that impression by the scientists, that fall-out isn't so bad as we thought it was although Khruschev recently said that he admitted that there was some danger about it, he said he needed to do it any way. Are we coming to that position ourselves with statements being made by our scientists, including yourself, that fall-out isn't so bad.

Dr. Seaborg: No, it's very difficult to put this into perspective. On the one hand, the danger of fall-out has been exaggerated when people, for example, are afraid to go out of doors without ~~or to even~~ put a coat on or a hat on because they just fear there is going to be this dangerous material fall all over them of they boil their water, etc. That is obviously an exaggeration. On the other hand, I wouldn't say that it is harmless. It is obvious that the radiations that impinge on the human body from fall-out are not good// for the body so that the truth is somewhere in between. It is complicated further by whether

(more)

you are talking about the genetic effect, the effect on future generations, or the sematic effect --the current damage on presently living people/will show up in diseases later on, lukemia, etc. Here you get into a statistical problem that is difficult to understand. For example, one type of genetic effect that can lead to malformations in birth can occur once in a million births. Well, now if you measure that over a number of generations where there may be 50 or 100 billion births involved, even one in a million is 50 or 100 thousand. So it depends on how you look at it. I think one such event is to be deplored and avoided if it can be.

Mr. Kennedy: But you're going to have malformation anyway, aren't we?

Dr. Seaborg: We have them for a number of other reasons. This isn't an argument to add to it. It just means we have to keep the whole thing in perspective and understand these statistical numbers and weigh them against the needs that are determined by/our national security.

Mr. Kennedy: In other words, if we had to measure them against the possibility of a future war against the possibility of a future mutations.

Dr. Seaborg: That is something that has to be weighed. And this is just the fall out from the testing when I talk about

(more)

numbers like this. The fall-out from a war brings these numbers up to orders of magnitude.

Mr. Kennedy: Is this the number that you mentioned - one in a million.....

Dr. Seaborg: Well, I used that as an example ; I don't even know whether that is a sound number but for some genetic effect, some number of that type would apply and here again, and I welcome the opportunity to comment further on this, there is a wide difference of opinion among scientists as to what that statistical number is. Some would say that for this particular genetic effect it is one in ten million; others might say it was one in a hundred thousand births. The scientific data are lacking. It is also true for the current damage. The proportion of cases of lukemia will be developed later in life, shortening life by some number of days. Scientists are not agreed as to what these statistics are.

Moderator: Excuse me, Mr. Kennedy, may I interrupt just a minute. We will be back to the discussion in just a moment.

Mr. Kennedy: I was thinking of following that line of fall-out to speculate on the Russian pollution of the atmosphere. Are they in a position now, say after stopping their 31-bomb test series, to say that the atmosphere has enough radioactivity now and there should be no more testing. Can we go on testing without damaging or endangering the atmosphere?

Dr. Seaborg: Well, they could use that argument, yes.

Mr. Kennedy: Successfully?

Dr. Seaborg: I don't know whether it would be successful with some people and not with others. It is a matter again of weighing this relative danger between the fall out and the needs of our national security. I can say this: The United States should it decide to resume atmospheric testing, and I want to emphasize this decision hasn't been made; this is being very carefully weighed. But should it decide, I am sure will limit the bombs tested. They would -- the United States would never consider the ---exploding these bombs one after the other almost every day or every other day at these high megaton levels. There would be a very carefully considered sincere attempt to limit the total and also to do it under such conditions where the actual world-wide fall-out would be at a minimum.

(more)

Mr. Kennedy: To limit the fall-out as well ?

Dr. Seaborg: Yes.

Mr. Thompson: Dr. Seaborg, that brings up a question : Most of the fall-out, the bad fall-out, comes from the big bombs, the multi-megaton bombs. How about the little bombs we use for tactical purposes? The kiloton bombs -- do they have any dangerous fall-out, radioactivity?

Dr. Seaborg: Well, ~~kkeyxxxxx~~ that's just about in proportion to the size of the explosion: if it is 50 kilotons, it is one-thousanth as much as the 50 megaton.* But now we get into the matter of whether it is local fall-out or world-wide. The big ones are apt to be up in the atmosphere, high and worldwide; the small ones, particularly in actual use would be nearer the ground. Then that would be a matter of local fall-out.

Mr. Thompson: Can they be tested outside of the atmosphere?

Dr. Seaborg: Yes, they can.

Mr. Thompson: Wouldn't that he a safer place to test some of these big ones?

Dr.Seaborg: That is a possibility; it is more difficult, more expensive. You have to have all of the lifting capability to bring them up fully outside of the atmosphere. A great distance, if you are going to be truly outside the atmosphere. You would

(more)

* (Assuming all fission)

have to explode them at a height, oh, roughly speaking, several times the diameter of the earth; in other words 50 thousand miles, or something of that sort.

Mr. Thompson: When you get that far up, does a regular hydrogen bomb, then become a neutron bomb, just emitting neutrons without any explosion?

Dr. Seaborg: No, it is no different.

Mr. Thompson: It's no different; you still have fall-out but would stay up in the atmosphere?

Dr. Seaborg;;: If it gets up, if you explode it high enough, then the influence of the earth on the debris is no longer there and it remains in space. It has no more reason to come back to earth than it does to another planet.

Mr. Thompson: Is there any reason to believe----

Dr. Seaborg: Or just remain inspace is more likely.

Mr. Kennedy: Dr. Seaborg, is there any reason to believe that Russia is ahead of us in nuclear technology as a result of these recent tests?

Dr. Seaborg: No, I don't think there is. However, I think this is a vague term and I don't like to comment in terms as to who is ahead and who is behind because it depends on so many things. It is not the type of term that I like to use but if I am going to need to make a vague

(more)

statement of that sort, and with the understanding that people will know it is vague, then I would say that I am confident that we have the advantage. This is in terms of over-all numbers of weapons and kinds of weapons and sophistication of weapons.

Mr. Kennedy: Dr. Seaborg, in sophisticaion of weapons, do we actually have now a trigger for the neutron bomb, aside from the non-uranium bomb trigger?

Dr. Seaborg: Well, I am persisting in not commenting directly on any particular type of weapon like the so-called neutron bomb.

Mr. Kennedy: That would be classified?

Dr. Seaborg: Yes, the development of ~~xxxxxxxxxxxxxxxxxx~~ particular types of weapons is classified information. I might say that it is a vague term; all bombs give off neutrons. I presume you mean by neutron bomb, a bomb that emphasizes or depends chiefly on the fusion reaction without the fission trigger.

Mr. Kennedy: Yes.

Moderator: ~~Mr. Kennedy~~: Doctor, you will have to excuse us for using vague terms. That's an easy question (laughter). (garbled)

Dr. Seaborg: Yes, in that case, it's a term that is used all the time.

Moderator: We just know what we read in the papers!

(more)

Dr. Seaborg: Yes, and that does bring me to one of my pet topics, and that is I believe the American people in general, and ~~broadly~~ broadly, need to increase their scientific literacy and maybe programs like this will help, because I firmly believe that they need to understand ~~these~~ these arguments about fall-out - what they mean; otherwise, they are sort of at the mercy of these extreme points of view and they are not able to form a real judgment.

Mr. Thompson: Does it mean that you have to pick your scientist?

Dr. Seaborg: Well, ~~there~~ there is -----

Mr. Thompson: Because there is so much disagreement among the scientists?

Dr. Seaborg: I don't think I want to go on record as agreeing with that statement. (laughter)

Mr. Thompson: Scientists don't agree among themselves; they're human.

Dr. Seaborg: They are human and in many cases the data are lacking on which to perform a precise judgment.

Mr. Thompson: In trying to understand the danger of fall-out, the worldwide danger or the danger from fall-out which would come down later in the year - that sort of thing - and the effect it would have today and the effect it would have on future generations, as you say, there seems to be a ~~wide~~ wide difference of opinion.

Dr. Seaborg: My point there is that I believe the arguments are sufficently simple, the broad arguments so that broadly the public could understand them, if they took the trouble to try to do so, and this is what I mean by basic scientific literacy.

(more)

Mr. Thompson: Are you----

Dr. Seaborg: The future of our country almost depends on there being more of that kind of knowledge widely spread thoughout our population. This ability to reason and think on the basis of --well, really basic scientific principles. Not advanced principles, just simple basic principles

Mr. Kennedy: Dr. Seaborg, we have been talking about the uses for military purposes. What about Operation PLOWSHARE. All this - We sort of lost sight of the fact that underground testing and that there was a great idea for using atomic power for mining ore and for oil and for harbors. What about that?

Dr. Seaborg: Excavations, scientific experiments----

Mr. Kennedy: Are we going to do that?

Dr. Seaborg: Yes, we are going ahead with the PLOWSHARE Program and there is an explosion, the so-called GNOME explosion scheduled for the New Mexico in the Carlsbad area for December.

Mr. Kennedy: Well, that will be underground.

Dr. Seaborg: That will be underground.

(more)

Mr. Kennedy: Some of that Operation PLOWSHARE Projects will have to be above-ground, won't they - eventually?

Dr. Seaborg: Well, not----no, oh, I wouldn't say there aren't some that might but those that I can think of, even the excavation projects, ~~xxhxxdxx~~ are essentially underground. They are sometimes, I suppose, near the surface. However, this particular experiment has a number of purposes. One is to see whether we can recover the heat developed in the explosion, turn that into electricity, not as a result of this one explosion but I mean to study the principle and the others are to study some neutron physics, make radioactive isotopes, study the excavation capability, etc., etc.

Moderator: We have about a minute left, Dr. Seaborg. ~~Xhxx~~ What do you think has been the world reaction to these Russian tests?

Dr. Seaborg: Well, it's been ---

Moderator: Changed any of the uncommitted nations?

Dr. Seaborg: I think that it has been one of pretty general revulsion but there again with a difference, depending on what nation you are thinking about and it is not always easy to tell because I believe some of these smaller nations are afraid to express their real opinion, which, of course, is not the case when it comes to the United States. There they feel quite free to criticize.

(more)

Mr. Thmpson: And we won't get as much criticism if we resume because we won't be letting off a big bomb, as big a bomb.

Dr. Seaborg: That's right, but we may get a good deal of criticism just for the reason that people aren't afraid to criticize.

Moderator: I am sorry, gentlemen, our time is up. Our thanks to our special guest, Glenn T. Seaborg, Chairman of the Atomic Energy Commission, and to the newsmen here tonight, Robert E. Kennedy, Chief Editorial writer for Sun-Times, and John E. Thompson, Military Editor of the Chicago Tribune.

We will give you a preview of next week's program in just a moment.

(commercial)

PLEASE CREDIT ANY QUOTES OR EXCERPTS FROM THIS TELEVISION PROGRAM TO RUTH HAGY'S "COLLEGE NEWS CONFERENCE."

C O L L E G E N E W S C O N F E R E N C E

15 Park Avenue

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GUEST: GLENN T. SEABORG, Chairman, Atomic Energy Commission

PANEL: RUTH HAGY, Moderator

WILLIAM WONG, U. of California

PAM RYMER, Stanford Law School

JOHN Granville, U. of California

SUSAN SHAW, U. of California

Produced by Ruth Hagy Productions for National Educational Television Network. Also carried by Metropolitan Broadcasting Network. Recorded in the studios of Station KQED, Berkeley, California, December 16, 1961.

PLEASE CREDIT ANY QUOTES OR EXCERPTS FROM THIS TELEVISION PROGRAM TO RUTH HAGY'S "COLLEGE NEWS CONFERENCE."

ANNOUNCER: "National Education Television presents College News Conference, where the leaders of tomorrow meet the leaders of today. Now, here is the creator and moderator of College News Conference, Ruth Hagy."

HAGY: "Welcome to another uncensored edition of College News Conference. Dr. Seaborg it is a great honor for us to have you here in KQED studios and an even greater pleasure for us to be visiting you here in San Francisco just across the bay from Berkeley where you spent so much of your time in research as the professor and finally as chancellor of the University of California."

SEABORG: "Well Miss Hagy it's a pleasure for me to be here, back among my many friends at station KQED, and also to be back near the university where I've spent so many years and with three of my former students at the University of California at Berkeley."

HAGY: "Well, I'd like you to meet them more formelly at this time and they are -- three are from the University of Californai. First I would like you to meet Robert (sic) Granville, an honor student in physics and recently named a distinguished military student in Air Force ROTC. He is looking forward to a career he hopes in aerodybamics, and then Susan Shaw, Senior representative on the executive committee of Associated Students at California, a major in communications and public policy. And then William Wong, managing editor and editor-elect of the Daily Californian, student newspaper at the University of California, and finally, from Stanford University Law School, Pam Rymer a frequent visitor to this program when she was at Vassar and chairman of the International Relations Club of that school."

SEABORG: "If I could break in I didn't want to slight the representative from Stanford University (MANY VOICES AT ONCE) our friendly rival across the bay."

HAGY: "Yes. Students, I don't think you need to be told very much more about Dr. Seaborg, his work is so well known.

I think it was interesting that it was at the age of 28 he made the discovery of plutonium and later on discovered nine more elements in coordination with other of his colleagues, work which finally brought him the Nobel Peace Prize in 1951 he served as the chancellor of the university until he was called to Washington to head the Atomic Energy Commission and he is the man who is in charge of atoms for war and for peace and here's the first question for him. Suzy."

SHAW: "Dr. Seaborg, there is an area that has been quite interesting and provocative among college campuses I know our own and this is in light of the fact that a scientist is naturally involved in matters of national and local concern and the discussion that we have had and continue to have on the many public roles and responsibilities of the scientist in interpreting his work to both the public at large and in interpreting his work to governmental agencies and bodies which may have use of this knowledge and in appreciation of the technical implications thereof.

"Dr. Willark Libby, who is former AEC chairman recently said that scientists should not speak outside of their own area of competence on matters of public concern. However there are other scientists such as Dr. Hans Bethe who feel that science -- scientists -- must take a much more active role in national affairs and not be confined merely to their own areas of concern.

"From an article in the Herald Tribune which appeared recently, Dr. -- Professor Arnorld Ticelis (?) who is head and a colleague of yours of the Swedish Nobel Institute was addressing the Nobel prize winners recently where he said that science may lose control over its own development and he called for an international code of morality to govern scientific research if we are to continue to survive.

"So I have two questions that I would like to ask you on this subject. One is whether or not you share the apprehansion of Dr. Ticerius in this uncontrolled development of science, and then secondly if you would comment on and discuss briefly the roles and responsibilities of a professional scientist to take an active part in world affairs and national problems."

SEABORG: "Well Sue you've (SEVERAL VOICES AT ONCE) yes..."

HAGY: "But they've important ones..."

SEABORG: "I'd like to begin then with a response to the dilemma posed by me good friend Arnur Terceilus. He did make

those remarks; I saw them in the newspaper when he addressed the Nobel prize winners in Stockholm, the Nobel prize winners for 1961.

"I share his concern that there must not -- that this is a difficult question, this -- how did he put it? Uncontrolled..."

HAGY AND SHAW SPEAK IN UNISON

SEABORG: "...scientists would lose control. I don't think however that it's a problem for the scientist alone. I think this is a problem that we all must share, non-scientists as well as scientists, and this brings me to one of my favorite topics, subjects, and that is my feeling that there must, there simply must be a greater degree of scientific literacy among the general public. These problems that are posed by science certainly do enter the political framework -- well they enter into the whole society in many many ways. Our economic future has become geared to science and I just feel that the entire population in a democracy, if a democracy is going to survive, has to learn more about science even I would go so far as say some of the fundamental principles of science.

"I think I have in a way answered your second question Sue. I believe that scientists should participate in government, that they should do more than just speak when they're spoken to. In short I believe I agree in that respect more with my good friend Hans Bethe than I do with my good friend Willard Libby, both or whom I've know for -- for many years."

HAGY: "You know C.P. Snow, another great scientist and scientific writer at least, has posed the problem in another way. He is concerned about the gap between the scientist and the decision-maker. Do you feel that as another phase of the question that Sue brought up so the decision-makers understand the consequences of the highly technical, of complex..."

SEABORG: "I would say more and more but not to a sufficient degree. C. P. Snow wants more scientists in..."

WOMAN: "Policy making..."

SEABORG: "Policy-making position or in places where they can effect policy making and I believe that in general I agree with him."

HAGY: "Go ahead."

STUDENT: "Dr. Seaborg, you said that..."

HAGY: "Bill."

WONG: "...the -- one of your favorite subjects is greater scientific literacy. How would this greater scientific literacy be best disseminated if -- if the -- if the scientist is to get closer let's say to the -- to the..."

SEABORG: "Well how -- you mean really how would it be acquired..."

WONG: "How it would..."

SEABORG: "I am not too concerned about it being acquired by the coming generation. I have six children of my own and I notice the -- the amount of science, the learning even now in grammar school beginning first and second grade all the way up through high school I do feel that as a result of all of the curriculum improvement studies that are going on in high school chemistry, physicis, biology, mathematics you know supported by the national science foundation that the coming generation is going to have this scientific literacy elementary school science is being improved, but even for the the coming generation I'm concerned at my own level of responsibility. I don't believe the colleges and the universities are doing their job to a sufficient degree. I think they should carry on what is happening in the elementary schools and the high school to teach science across the board, to the non-science majors.

"So if that could be added to what is happening for the coming generation I believe we have it solved. Therefore it's the present generation, the older people and there I think they have to do it by working, by reading, scientists have to cooperate to try to help, to impart this knowledge, educational teveovision, perhaps this is an example, is a means of imparting this information to those who've finished school, and newspapers and magazines and so forth. The problem however there is more difficult as it depends more on the people themselves taking the trouble and the time to learn about it."

HAGY: "Pam."

RYMER: "We've got a bare thread of continuity here. I'd like to ask you in general in terms of our preparation for nuclear warfare, it might be said that the State Department and policy consideration could be a headache to you on the scientific

end after the Russian tests I now recently you observed that the President would base a decision entirely on the technical need for information."

SEABORG: "Yes."

RYMER: "And I wonder on the basis of the Russian tests if you feel such a technical nessisity now exists..."

SEABORG: "Now you're -- you're ...."

RYMER: "For continuing testing."

SEABORG: "You're talking about the decision for atmospheric testing..."

RYMER: "Yes."

SEABORG: "...whether atmospheric testing should be resumed. No I wouldn't feel that I could answer your -- your -- your question directly and straight out. The Russian tests, the results of the Russian tests, are beging analyzed and preliminary reports have bee issued..."

HAGY: "Uh-hm."

SEABORG: "As you know..."

HAGY: "Yes."

SEABORG: "...as to their results and this information will be taken into account together with other considerations, obvious ones concerning our national security, and certainly taking into account the -- the -- the whole question of the international implications and so forth before the President makes the decision. He has not made the decision yet."

RYMER: (?) "Well -- the President -- recently -- said -- and I'd like to quote him -- that should tests be deemed necessary to maintain our responsibilities for free-world security they will be undertaken only to the degrees that effective progress is not possible without such tests..."

SEABORG: "That is right Pam."

RYMER: "Now ther -- there've been many observations in Time and in Newsweek and so forth that we are going to resume testing.

It seems we are -- are the pro -- the processes is prepared. Would you say that this would suggest if we do resume testing this spring that we need to catch up with -- with the results of the Russian tests?"

SEABORG: "Well, it's a hypothetical question. You're basing it on the premise that the President might decide to resume atmospheric testing."

RYMER: "Uh-hm."

HAGY: "Only on the basis of technical need."

RYMER: "On the basis of technical need."

SEABORG: "And on the basis of technical need."

RYMER: "Yes sir."

SEABORG: "Ah..."

HAGY: "He certainly would do so reluctantly wouldn't you agree?"

SEABORG: "Oh I think so yes he would come to this conclusion along the lines that he felt it was absolutely necessary. It wouldn't -- it wouldn't be only a matter of catching up, if we are indeed behind in any aspect and that -- that would be debatable.

"It's a matter of rate of progress, because I -- in my mind the years ahead are probably more important than our relative position today. So it's a matter of rate of progress too and I want to emphasize that."

HAGY: "Go right ahead, Bob."

GRANVILLE: "Dr. Seaborg, the preliminary reports of the recent Soviet tests have seemed to imply that they made three significant advances with these tests, one being smaller bombs with higher yield, the second cleaner bombs and the third possible anti-missile weaponry. And this last advance implies to me a possible defense for the so-called ultimate weapon do you feel that the Soviet tests imply that they have perfected an anti-missile weapon?"

SEABORG: "We haven't yet finished our analysis on that and released an official evaluation. We have on the first two. It does appear that they have made important advances in reducing

the amount of the fission required to explode the larger thermonuclear weapons in the megaton range."

HAGY: "Go ahead."

GRANDVILLE: "Are we actually behind in the field of anti-missile weaponry by these preliminary reports?"

SEABORG: "Well I don't think we are but I always hesitate to use the term ahead or behind because there are so many aspects to the problem. There's the matter of the sophistication of our own warheads, how vulnerable they are, or invulnerable. There's the question of our smaller weapons, tactical weapons, question of how many weapons we have, the question of the capability of delivery of these weapons and the question of the anti-weapons.

"So when you get into that large complex to talk about being behind or ahead is very misleading."

GRANDVILLE: "Well, are there any manifestations that would be shown to the American public that we have made relative advances in this field?"

SEABORG: "In?"

GRANDVILLE: "Anti-missile weapons."

SEABORG: "Well I don't know just what you would mean by manifestations..."

GRANDVILLE: "Well specific..."

SEABORG: "...it's just this over-all evaluation that we're -- that in this complicated array of factors that must be considered we do not feel that we are behind."

HAGY: "Well may I ask you this question. Do you think it is possible at the moment we have a Nike Zeus, which is an anti-missile..."

SEABORG: "Um-hm."

HAGY: "Is it possible for us to make further advances and get a more sophisticated system of protection in the anti-missile field..."

SEABORG: "Yes..."

HAGY: "...the protective field..."

SEABORG: "Yes..."

HAGY: "...without atomspheric testing? Or do the underground testing or do we need new tests?"

SEABORG: "Well, when it comes to the area of the effects of weapons on weapons in the atmosphere -- that's really what you're asking -- then you have to do atmospheric testing. Yes."

HAGY: "Yes. It would be -- it would be necessary. Go ahead Susie."

SHAW: "Why not such information be gained to a large extent of a technical nature from underground testing?"

SEABORG: "Oh a great deal can be gained."

SHAW: "Such as this Project Gnome."

SEABORG: "Yes."

SHAW: "That's been so recently..."

SEABORG: "Yes. Well in the case of Project Gnome of course this is directed completely to the peaceful uses of nuclear explosives. That is not directed at all towards the development of weapons."

SHAW: "Well but cannot some information be culled from these peaceful experiments to be applied to our military need, I mean..."

SEABORG: "Well there are -- there wouldn't be any real purpose in that, Sue, because we are conducting a series of tests underground directed toward the improvement of weapons, you see, so there for it wouldn't be desireable or necessary to complicate the peaceful tests with the military aspect, and it in fact is not done. In other words an explosion like the Grnome explosion was directed exclusively to the study of many peaceful uses of nuclear explosions and I could enumerate those for you if you wished."

HAGY: "Could you tell us a little bit about the significance of the Gnome test. I know a few things went wrong -- there was some samll atomic radiated bomb -- cloud that came out of it..."

SEABORG: "Yes."

HAGY: "Some steam was..."

SEABORG: "Yes."

HAGY: "....generated. What -- could you tell us a little bit about..."

SEABORG: "Well..."

HAGY: "That's part of Plowshare, is it not?"

SEABORG: "Yes, that's part of Plowshare."

VOICE OFF MIKE: "Supposed to be part of Plowshare."

SEABORG: "Well actually, you know I'm going to surprise you and say almost yes. This little escape of steam that occurred has attracted much to much attention. In the first place the amount of radioactivity that escaped was negilbible.

"There are these many vents, these pipes that are connected with the experiment in order to extract samples and get access to the experimental equipment and so forth. The fact that a little bit of radioactivity came out through one of those actually meant that some radioactive samples could be collected very early and some information obtained that wouldn't have been obtained otherwise. As a matter of fact I believe I would have listed that as one of the purposes of the experiment, just a small amount, because actually they wanted quick samples to come out, and let me emphasize that the amount of radioactivity that escaped was just entirely neglibible.

"But the purposes that were listed were to trap the energy of the 5000 tons, the five killtons of nuclear explosion in the medium, so that later on it could generate steam that might be brought to the surface to generate electricity, to make isotopes and to study certain fundamental neutron properties and to get some information about earth moving -- digging; this is one of the applications possible for nuclear explosions and for -- to study the effects in salt media because the other explosions have usually been down underground in other medium.

"As a matter of -- so far as the future's concerned, I'm particularly interested in the aspect of making isotopes because it may be possible to make and discover new transuranium isotopes of the type you mentioned earlier, Miss Hagy. As a matter of fact, two of the transuraium elements, those with the atomic numbers 99 and 100, named einsteinium and fermium, were discovered first in a nuclear explosion. They were discovered

in the debtis that was collected after the first thermonuclear test explosion, the Mike explosion, held in the Pacific on November first 1952.

"So I'm particularly interested in -- this is just a personal matter -- all of the other things are important too in making these transuranium elements."

HAGY: "I think besides having six children you've also been the father of nine elements (LAUGHTER). Mr. Grandville."

GRANDVILLE: "Dr. Seaborg, in general since we're on the subject of underground testing, what is the advantage or advantages of underground testing as opposed to atmospheric testing?"

SEABORG: "Well there are certain experiments in which you can control it better, your instrumentation, your geometrical arrangements and so forth, for low-yield tests. You're independent of the weather. You're -- the winds and so forth outside are of no particular concern or certainly of secondary concern, so that you can keep your schedule better and so forth.

"Of course the size of the test is limited, and the diagnostics is somewhat more limited in certain cases. In other cases it's better. I mean you learn more about it."

HAGY: "Pam."

RYMER: "I'd just like to go back to the Plowshare..."

SEABORG: "Um-hm."

RYMER: "In a different connection. I know we're all very concerned about radioactive fallout..."

SEABORG: "Yes."

RYMER: "And about the campaign for a clean bomb."

SEABORG: "Yes."

RYMER: "And I wonder first of all if Operation Plowshore can be said to have any connection with attempts to develop a clean bomb and if it if it if it does and then your comments on the danger of radioactive."

SEABORG: "Yes. Well..."

RYMER: "Fallout from..."

SEABORG: "Yes Pam, it does have a connection in the aspect of the earth-moving for many of the applications, digging canals and so forth..."

HAGY: "You would need to have clean..."

SEABORG: "You would need a clean weapon that had the minimum of fission products or as we refer to it, fallout."

SHAW: "Well one of the questions that always arises when we talk about radiation and its effects is this kind of emotional scare about genetic effects, and this goes back to a great extent to the way in which scientists and people who are in positions of knowledge can express this and can interpret it to the public at large.

"Now we have varying opinions on all sides, and let me quote from Professor Cyril Comar (?) who's head of the physicial biology and radiation field lab at Cornell, and he was speaking of the genetic effects of test fallout and he quotes -- he says, and I quote, 'As I see it the absolute effect in terms of the numbers involved in human suffering will be very small. It will be of no significance.' Now we hear something like this and we feel kind of comfortable about it and yet we hear men on the other -- on the other extreme.

"In terms of what we've just been discussing, of the peaceful uses and the atmospheric testing, and realizing that there is a difference of the radiation fallout here, what -- to what extent can we determine now -- or is there a possibility of genetic harmful effects of radiation?"

SEABORG: "It's interesting to say that in a sense both people -- those who are worried and those who are not worried -- are right, and this is a paradoxical statement and let's see whether I can explain it further.

"And here is one of the biggest arguments for the need for scientific literacy that I could propound. You get into the area of statistics. Let's say that there's a certain genetic effect and I won't try to identify it further, that as a result of the radiation given off by fallout will comein one in one million births. Now that's a small number and many people will say that's negligible, one in a million; it certainly doesn't concern you or me, or our children.

"Another people will point out however that if you take the next five or ten generations and therefore speak in terms of what shall I say -- one hundred billion people, and you divide one hundred billion by one million, which is fairly easy to do and you come out with 100,000. So this person says 100,000 people will be affected adversely in a genetic way, and this is bad.

"So you see in a sense they're both right. You can't say that there's absolutely no effect."

HAGY: "Dr. Seaborg, Sue's raised a point that I'd like to see -- hear you express and opinion on, one step farther. Can there be any real development of atomic energy for peaceful purposes? You know we had such great hopes that atomic energy was going to lighten man's burdens, was going to revolution the world and give us cheap power and really make great, you know -- can we ever look forward to this time until you've licked the problem of radiation for example even reactors so that they'd give up radiation and..."

SEABORG: "Oh yes. I don't think that's going to be a crucial factor in the development of reactors because their radiation is under control except for a rare accident."

HAGY: "But supposing -- I mean could you cope with an accident that happened near a large population center, supposing something happened to near Chicago or New York."

SEABORG: "It is possible to make the probability for that so low that it's essentially negligible -- lower than the probability for the other types of industrial accidents..."

HAGY: "Is that so. Um-hm."

SEABORG: "...that in the aggreagate are present. And this is because it's being handled from the point of view of recognizing the potential danger there you see, so these reactors are built under the conditions of maximum saftey. They're built in a way where they're contained with a population exclusion area around them and so forth, all directed towards what they call the possibility of the maximum creditable accident -- very far fetched, very small probability.

"And so I wouldn't think that this is going to be a matter that's going to be of concern in the development of the industrial, commercial nuclear power. The economic..."

HAGY: "Well why has it been so slow?"

SEABORG: "The economic factor."

HAGY OFF MIKE

SEABORG: "It is -- the other sources, the commercial, the chemical sources of fuel, chemical fuels for the development of the heat that's turned into electricity are cheaper. However as the nuclear power source is further developed, it seems like it will catch up economically at least in those areas where the chemical source is expensive, and that turns out to be by the way here in San Francisco and in New England, the Pacific coast and New England the nuclear source should catch up in cost in about seven more years, 1968 or so."

HAGY: "I'm sorry we can't take you any further into the future because we've just run out of time. You must come back ..."

SEABORG: "In the present for another visit with us so that we can discuss more possibilities of atomic power. Thank you for joining us, Dr. Seaborg."

SEABORG: "Well I enjoyed it very much."

HAGY: "And thank you students and we want to invite all you at home to join us again next week for another uncensored edition of College News Conference and until then good bye and a good week. Ruth Hagy and the college correspondents of College News Conference."

ANNOUNCER: "College News Conference is produced by Ruth Hagy for the National Education Television and Radio Center. Executive producer, Donald S. Hillman. This is NET -- National Educational Television."

STATEMENT 1/31/63

CHAIRMAN SEABORG

Gentlemen - Our purpose is to provide the relative achievements of the U. S. and the U. S. S. R. on the nuclear testing recently conducted by both countries; the speakers who follow me will concentrate on the status of our own (U.S.) development program.

You were given a fairly comprehensive briefing on the scope of the recently completed test series of the Soviets but I thought it might help your understanding of the comparison between the two testing programs, theirs and ours, if I briefly summarized the numbers of tests conducted on each side. As you know, since the moratorium, the Soviets have conducted two test series. In the first series, during the Fall of 1961, we detected about 45 tests. In the second Soviet series from July to the end of December. 1962, we detected about 66 Soviet tests. These two series appear to involve devices ranging in yield from a fraction of one kiloton to approximately 60 megaton, with total yields of about 100 megatons in 1961 and 180 megatons in 1962. In addition to the many atmospheric tests, the Soviets included a few underground tests and six high altitude detonations. During the same period, the U.S. began testing with a few underground tests in the Fall of 1961. In 1962, the rate of underground testing increased for a total of 69 tests for both years. From April through November 1962, we had a total of 39 atmospheric tests, with a total yield of 38 megatons, the largest detonation being 10 megatons. Five of these events were effects tests at high altitudes; one was under water; and three were complete weapons systems tests.

The assessment of most probable interest to you is to the effect that where we have concentrated effort, we appear to be ahead and where the Soviets have concentrated effort, they appear to be ahead. I have selected ~~(from the report of the working group)~~ a comparison of yield to weight ratios which illustrates the kind of data available to furnish a basis for ~~(the above)~~ this conclusion. -- CHART 1 --

The vertical scale of this chart is a linear representation of kilotons per pound while the horizontal scale is logarithmic representing the warhead weight in pounds. In using the parameter yield-to-weight, however, I would like to caution that the ratio, although useful for comparison purposes, is only valid when one applies it to a general weight class without making cross-comparisons with other weight classes. Consequently, one should not use the yield-to-weight ratio in comparing low-weight with high-weight weapons since a high ratio is more readily attainable in the larger, heavier systems. In addition, the weights of many of these warheads do not include ancillary components which are necessary for adapting devices to delivery systems. Also, the accuracy of the data I will present with respect to the Soviet tests is questionable. While the data ~~does~~ represent our best guess, there may be considerable error in ~~it~~ their - either on the high side, or the low side. The test devices and weapons represented on the chart are only a selected few that have been chosen to depict the weight and yields available across the entire weapon spectrum.

The US tests are depicted with large blue circles for devices (such as Cello, Ripple, Zippo) and blue triangles for weapons - the latter are shown by Mark numbers.

The Soviet experiments are depicted by the red circular areas and Joe numbers with no differentiation as to device or weapon since such differentiation is highly uncertain.

You will note that the US accomplishments appear to be superior in the weight class below 1,000 lbs, especially in the 600 lb area where direct comparison can be made with the Joe 56 event. Low weight classes down to the one and few hundred pound areas are shown for the US, but we know nothing about USSR devices in this area. The MK-54, (Davy Crockett) and MK-48, (155 mm atomic artillery projectile) are shown on the chart to indicate special ~~unique~~ low-yield, low-weight capability of US weapons in the tactical application area. These low-weight items also indicate the very low yield-to-weight ratio (0.0003 for MK-54; 0.0007 for MK-48) possessed by items for special applications.

The Soviet experiments between 1,000 and 10,000 lbs appear to be generally equivalent to US efforts.

At 10,000 lbs and higher, the Soviets have a clear-cut advantage in yield-weight ratios with the MK-41 as the only US candidate in the y/w area about 2.0. The use of the Ripple approach promises an increase in y/w

ratio from about 2 to approximately 5, but at the expense of further testing.

In summary, the US and USSR test series conducted in 1961 and 62 show that the US appears to have a superiority in designs in the lower weight classes, i.e., under 1,000 lbs but a decided disadvantage in the higher classes, i.e., over 10.000 lbs.

I will be followed by General Betts who will present in more detail the status of the U. S. development program.

May 21, 1963

M E M O R A N D U M

on cooperation in the field of utilization of atomic energy for peaceful purposes between the U.S. Atomic Energy Commission and the State Committee of the USSR for the Utilization of Atomic Energy pursuant to the Agreement between the United States of America and the Union of Soviet Socialist Republics on exchanges in the scientific, technical, educational, cultural, and other fields in 1962-1963.

The U.S. Atomic Energy Commission and the State Committee of the USSR for the Utilization of Atomic Energy;

Bearing in mind the cooperation implemented to date in the field of peaceful uses of atomic energy;

Desiring further expansion and development of this cooperation;

Recalling Section II (3) of the Agreement between the USA and the USSR on exchanges in the scientific, technical, educational, cultural, and other fields in 1962-1963, signed at Washington on March 8, 1962;

Have agreed upon the following arrangements and procedures for carrying out reciprocal exchanges in the course of 1963-1965;

I. Exchange of Specialist Visits

For the purpose of studying scientific and technical achievements in the field of peaceful utilization of atomic energy in the USA and the USSR, both Parties agree to conduct exchanges of visits by groups of specialists to scientific establishments in the USA and the USSR on an agreed and reciprocal basis in the following fields:

1. Nuclear power reactors, including fast neutron reactors and nuclear superheat reactors;

2. Plasma physics and controlled thermonuclear fusion;

3. Nuclear physics, physics of high and low-energy particles;

4. Solid state physics;

5. Purification and disposal of radioactive waste products;

6. The use of tracer compounds in medicine;

7. Radioneurological research;

8. Design and utilization of charged particle accelerators.

As to the production, separation, and purification of transplutonium isotopes, this question is subject to agreement in 1964.

The visits indicated above, as well as additional visits which may be agreed in these and other fields of peaceful uses of atomic energy, shall be carried out in accordance with the following procedures:

a. The specific dates and duration of visits, composition of groups, list of facilities to be visited, as well as the specific field of activity contemplated by each Side for each exchange of visits, shall be agreed upon between the U.S. Atomic Energy Commission and the State Committee of the USSR for the Utilization of Atomic Energy, and confirmed through diplomatic channels. However each group of specialists from either Side will consist of up to ten (10) persons and the length of each visit will be from 10 to 15 days.

b. In all cases the sending country will pay the subsistence, lodging, transportation and other expenses of its scientists and personnel accompanying them to their destination and return,as well as within the host country. The host country will be responsible for making suitable arrangements such as hotel accommodation and travel, and for providing necessary interpreters.

c. This Memorandum should not be construed to cover principles and conditions governing the participation of scientists and specialists of both countries in conferences (symposia) organized in the USA and the USSR.

d. Agreement in regard to any exchanges under this Memorandum may be terminated by either Side on thirty days notice.

II. Exchange of Research Specialists

The Parties agree to implement an exchange of 2-3 research specialists in each of the fields of controlled thermonuclear fusion, reactor techniques, and the physics of high-energy particles to gain practical experience and to study the performance of operating thermonuclear installations and apparatus, reactors and accelerators in the USA and the USSR for a term of not over one year. This term shall be determined by agreement in each separate case.

III. Exchange of Information

The Parties agree to exchange scientific information on a reciprocal basis by means of sending unclassified documents (books, monographs, and preprints) on current work concerned with the peaceful uses of atomic energy. The Parties shall each provide the other each month ten (10) new documents (2 copies each) starting from the month following signing of this Memorandum until the end of the term of this Memorandum. Initially, the exchange of documents would be in the areas in which the Parties agree to exchange visits. The number of documents to be exchanged and the list of areas of exchanges may be increased by agreement.

The Parties also agree to exchange doctoral dissertations in the fields of high energy physics, nuclear physics, solid state

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physics, controlled thermonuclear fusion, and the use of tracer compounds in medicine. Initially, the Parties agree to exchange forty (40) such suitable dissertations (two copies each) on current work, provided that this number may be increased by mutual agreement. In this connection the Parties have agreed that the dissertations sent by the State Committee of the USSR for the Utilization of Atomic Energy shall consist of dissertations for the degree of candidate of science as well as doctor of science.

In order that the International Atomic Energy Agency and its members may fully benefit from this cooperation, the reports and other documents which the Parties to the agreement will exchange will also be transmitted to the Agency.

IV. Holding Joint Conferences and Discussing Research on Specific Scientific Problems

The Parties agree to hold joint conferences of specialists of both countries to discuss works on low-energy nuclear physics (in the Soviet Union) and on purification of liquid radioactive wastes from power and research reactors and radiochemical laboratories, and solidification and disposal of radioactive wastes (in the United States). The scheduling of conferences and the number of participants shall be agreed upon later.

V. Exchange of Instruments

The Parties will consider the possibility of making available to each other scientific instruments on agreed terms and on a reciprocal basis. Such arrangements will proceed only to the extent mutually agreed upon and permissible under the laws and export policies of the respective countries.

* * * * *

The U.S. Atomic Energy Commission and the State Committee

of the USSR for the Utilization of Atomic Energy may, from time to time, come to agreement on additional proposals which will be subject to approval by both Sides.

This Memorandum shall enter into force on the date of its signature and shall thereupon replace the Memorandum on cooperation between the USA and the USSR in the field of the utilization of atomic energy for peaceful purposes, signed at Washington on November 24, 1959.

This Memorandum shall continue in force for the years 1963-1965, provided that its continuation beyond 1963 shall be subject to the anticipated renewal of the existing inter-governmental agreement on exchanges.

Done at Moscow on May 21, 1963, in duplicate in the English and Russian languages, both texts being authentic and having equal force.

For the U.S. Atomic Energy Commission

For the State Committee of the USSR for the Utilization of Atomic Energy

ATOMIC ENERGY COMMISSION

NEWS CONFERENCE

of

CHAIRMAN GLENN T. SEABORG

Thursday, May 30, 1963

American Embassy

Moscow, U.S.S.R.

PRESS CONFERENCE OF HONOTABLE GLENN T. SEABORG
CHAIRMAN, UNITED STATES ATOMIC ENERGY COMMISSION

Held at the American Embassy, Moscow, May 30, 1963

SPOKESMAN: Gentlemen, it is a privilege and a pleasure for us to have Dr. Seaborg and his distinguished associates here on an official exchange visit to the Soviet Union. Dr. Seaborg will introduce the members of his party, and make a statement about the visit that he has made to Soviet officials, and to atomic installations around the Soviet Union. He will then be open, together with his colleagues, for questions. It is a great pleasure indeed to introduce to you Dr. Seaborg.

DR. SEABORG: I would like to begin by introducing those in front. On my extreme right is Dr. Gerald Tape, who is a fellow Commissioner on the Atomic Energy Commission. Next is Dr. Manson Benedict, who is the Chairman of the General Advisory Committee of the Atomic Energy Commission. On my left is Mr. Alvin Luedecke, who is the General Manager of the Atomic Energy Commission, and sitting among you are the other members of our delegation, Albert Ghiorso, of the Radiation Laboratory of the University of California; Alexander Zucker, of the Oak Ridge National Laboratory, Tennessee; Albert Crewe, who is the Director of the Argonne National Laboratory, of Chicago; and Dr. Arnold Fritsch, who is one of my assistants;

and Mr. Algie Wells, who is the Director of our Division of International Affairs.

I want to begin by saying that we have been very warmly received in the Soviet Union. Our Soviet hosts have been very hospitable and have extended themselves in every way possible to make our visit very pleasant. We have seen everything that we requested to see on our suggested itinerary, and more. The discussions have been conducted within the framework that had previously been agreed on for the visit, and they were held within this framework. All of the discussions were held within this framework, and no attempts were made to extend the discussions beyond this framework.

We would hope to conduct this press conference this morning within the same framework, namely, within the area of the peaceful uses of atomic energy, which is the aim of this visit.

Now, I thought that I would begin by giving you a short survey of where we have been and what we have seen during our visit to the Soviet Union, and then after this, we will be ready for questions.

I will begin and describe our visits in chronological order as briefly as I can. Of course, you know that we arrived on Sunday, May 19, on President Kennedy's airplane, in the afternoon. We were met at the airport by the members of the Soviet State Committee on the Utilization of Atomic Energy.

Our first business began on Monday morning, May 20, when our entire delegation met with Chairman Petrosyants and his Deputy Chairmen, and other members of the State Committee and people associated with the State Committee, to discuss the itinerary for our entire stay in the Soviet Union.

We decided that in view of our limited time we would in certain instances divide into more than one group, so that we could visit in that way more laboratories and institutes and installations.

Our first visit was to the Moscow State University, where we were received by Rector Petrovsky and Vice Rector Vovchenko, whom I had met previously on one of his visits to Berkeley, California, and here we saw some laboratories, class rooms, living quarters, and the cosmic ray laboratory of Bernyev and Christiensen.

Then in the afternoon, one contingent, one part of the delegation, visited the Lebedev Physics Institute, of which Skobeltsyn is Director, and there we saw the solid state laboratory and one of their accelerators. That was the 30 MEV FFAG.

Another part of the group visited the Chemical Physics Institute under Academician Semenov, where they saw much of the work going on there in the field of chemical physics.

Tuesday morning was spent in signing the agreement on the peaceful uses of atomic energy, and in the afternoon we

visited the Central Academy of Sciences of the Soviet Union where we were received by President Keldysh, and a number of his colleagues in the Academy. There we had the pleasure to present to President Keldysh a folio commemorating - an album commemorating - the discovery of mendelevium, Element 101, which was discovered in American in 1955, and which, of course, as you know, was named after the great Russian chemist and originator of the Periodic Table, Dmitri Mendeleev.

We also had the pleasure of presenting the parchment of membership in the United States Academy of Sciences -- diploma, yes, that is a better word -- to Academician Semenov, who was recently elected to that Academy.

On Wednesday, we had a very intensive day of visiting the Kurchatov Atomic Energy Institute, which has as its Director Academician Aleksandrov. There we saw the work on controlled thermonuclear reaction under Artsimovich. We saw the cyclotron, which had a special interest to some of us, because Flerov had done some early work on the transuranium elements there.

We saw the materials testing reactor. We saw the swimming pool reactor, the so-called IRT reactor, which is the reactor that has been reproduced in many parts of the Soviet Union, as a sort of general research reactor. We saw some hot laboratories, some laboratories where early work on plutonium had been done. We saw the laboratory of alpha ray

spectroscopy, which is the laboratory of Baranov, a laboratory of particular significance in this field, and a number of other interesting scientific endeavors.

On Thursday, May 25, we visited the Institute at Obninsk with Director Rodionov, where we saw the work on fast neutron reactors. We saw the low energy BR-1 reactor, and then the BR-5 reactor: I believe that is 5 megawatts. Those are fast neutron reactors. We saw the first power station of the Soviet Union, AM-1, 5 megawatts, which has been operating since 1954. We saw the mobile reactor operating in the range of 1 to 2 megawatts, a reactor that can be moved from one site to the other. We saw the equipment for handling molten sodium, and sodium potassium, for the fast reactors.

On Friday we visited the reactor station at Ulyanovsk, or near Ulyanovsk at Melekess, and we were told that we were the first foreign delegation to visit this institute. Here we saw the 50 megawatt SM-2 high flux reactor, which by the way is the reactor I have indicated to have at the present time the highest thermal neutron flux of any reactor in the world, although others of higher flux are under construction in other countries.

We also saw here an organic cooled and moderated reactor of 5 megawatts thermal power, I believe, being assembled, and this will also be somewhat mobile and capable of being moved and reassembled in the order of a month for the assembly time.

We also saw the building where the 50 megawatt boiling water reactor will be built, and we saw the chemistry laboratory where work on the transuranium elements will take place under Yakolev. We saw still under construction the hot lab part and similarly we saw a large metallurgical laboratory under construction.

On Saturday we visited Leningrad, where a part of the group visited the Khlodin Radium Institute under Director Vdovenko, where among other things we saw work on nuclear emulsions and nuclear spectroscopy, the chemistry of uranium and transuranium elements, and the original European cyclotron of 1935, which is still operating. The latter will probably be torn down when they move all of the work to the new building.

Part of the group visited the Physical Technical Institute under the direction of Konstantinov, where they saw much interesting work, and the whole group visited the Scientific Technical Institute for Electrophysical Apparatus under the direction of Komar. There we saw their work on controlled thermonuclear reactions. We saw a one-fifteenth size scale model isochronous cyclotron, 240 centimeter diameter of the magnet pole piece, for variable energy protons up to 100 Mev. This is the cyclotron that can be reproduced as the result of the design at that institute and built in many laboratories, and is planned to be built in many laboratories in the Soviet Union.

We also saw, among other things, a medical accelerator for 5 MEV electrons.

Sunday was spent in sightseeing and a boat trip.

On Monday we visited the Novovoronezh atomic power plant under the direction of Chepak, where we saw the 200 megawatt pressurized water reactor under construction, and learned of the plans for the building of a second unit of 350 megawatts. I might say that we didn't have time to visit the station at Beloyarsk, but we did learn during our visit at Obninsk form the man at Beloyarsk who is in charge of the work there -- Orloff - about the plans or the progress of construction there of a 100 megawatt electrical plant which will be of the graphite-moderated boiling water, superheat type; and the plans that they have for building a second unit of about, I believe, 200 megawatts of the same type.

Then on Tuesday, the day before yesterday, we visited the Joint Institute for Nuclear Research at Dubna under the direction of Blokhintsev, and there we saw the heavy ion cyclotron of Flerov, the 10 BEV synchrocyclotron, or synchro-phasotron, the fast pulsed reactor, and they have there the 680 MEV synchrocyclotron. We didn't have time to see that. Also they have a laboratory of theoretical physics there; five laboratories in all there.

Part of the group visited the Physical Technical Institute at Kharkov, under the direction of Sinenlikov, on Monday,

where they saw the various linear accelerators in operation at that installation.

Yesterday, one of the group visited Dubna again. Mr. Ghiorso, and several of the group visited Serpukhov, where the 70 BEV synchrotron is under construction. I visited the Chairman of the Supreme Soviet, Breshnev, yesterday, and also the Minister of Higher and Specialized Secondary Education, Yelyutin.

I believe that brings us up to date. If you do have questions, we would appreciate it if you would identify yourself by name and your newspaper.

QUESTION: Shabbad, New York Times. What would you say of the prospects for really effective collaboration in high energy physics, in the sense of building joint large accelerators?

DR. SEABORG: We actually didn't discuss that on this particular visit. I think this is something that we will explore under the terms of the agreement for cooperation in high energy nuclear physics.

QUESTION: Could you say what some of the problems are?

DR. SEABORG: Yes. Two of them come to mind. One is the cost, which of course would in a sense be helped if it is a cooperative effort, and of course as a cooperative effort one can think in terms of truly international cooperation, involving many of the countries interested in the high energy nuclear physics field, including the United States and the Soviet Union.

Another problem that I foresee, which is fairly obvious, would be coming to an agreement as to where to build it, which country to build it in.

QUESTION: Mr. Silvenko, from the Izvestia Newspaper. What is your opinion of the celebration next year of the tenth anniversary of the operation of the first atomic power plants, and the cooperation of the American and Soviet scientists in the International Atomic Energy Agency?

DR. SEABORG: Well, in some ways those are separate possibilities, because the dates don't coincide for the two things that you suggested. I presume that you are thinking of the Obninsk plant which started in 1954, and I would say yes, I think that would be an event of sufficient significance so that the dicennial should be celebrated.

QUESTION: Czechoslovakian Radio. I should like to have your opinion regarding the results of your visit now, and the possibilities for further development of Soviet-American cooperation in the field of peaceful atomic energy. Nyet?

DR. SEABORG: Is that no?

QUESTION: You are the author of a very interesting book which was issued in the Soviet Union, Elements of the Universe. I should like to ask you in another issue of this book if you will add something about the new isotope of Element 102 which has been discovered at Dubna?

DR. SEABORG: In answer to the first question, I think that our visit has been very worthwhile and fruitful. I should add to what I have said in the description of our itinerary that we saw a number of other things that have never been shown to foreigners before, for example, the Radium Institute in Leningrad, and the organic cooled and moderated reactor in Ulyanovsk. We were privileged to see reactors actually under construction, which I believe no other delegation has seen, and I am sure the other members of our delegation could think of other such examples. So that I think we are off to a very good start in this new agreement, I should say. We have been cooperating in the past. But I think there will now be increased cooperation, and we are looking forward to the return visit of Chairman Petrosyants and his delegation perhaps some time this fall, October or November, perhaps. That will be up to him, of course. In the meantime and following that, I am sure that there will be rather extensive implementation of the agreement that was signed a week ago Tuesday.

Now, on the second question, I of course was gratified to learn that my book, The Elements of the Universe, had been translated into Russian and is so widely used. I believe that I was presented a copy at nearly every site we visited. I only wish that it were as widely used in the United States.

Now, with respect to your specific question as to whether I would mention in a revision the new isotope of

Element 102 discovered in the excellent work of Flerov and co-workers, I might say first I am not sure whether there will be a revision, and secondly, in that particular book, I have not gone into the detail of discussing individual isotopes, It is just too broad. But I have just finished writing a new book entitled, The Man-Made Transuranium Elements, which is for use at our secondary school level in the United States, and elementary college level, which will probably appear next month, and therefore will not have this new isotope in it because it is finished. In fact, I brought a number of page proofs of that book to the Soviet Union and gave them to a number of the scientists interested in the field. When that book is revised, and it is likely it will be, it would certainly include mention of this new isotope of Element 102, because that book does treat the various transuranium elements in that kind of detail, and that kind of fashion.

QUESTION: Vasilyets, Press Agency of the Soviet Union. I think as far as I know this Element 102 is the only element that still has no name. How can we solve this problem of how to name the element? I have an idea and what is your attitude to this idea. Taking into consideration the fact that both scientists from the Soviet Union and the United States made a contribution to the discovery of that element, maybe we shall just insert that fact in the name of the element. Let

us take the first letters of all the names of all the countries and call it Rusamerium, Russia and America, Rusamerium?

DR. SEABORG: Or Amerusium. I must say that Vasilyets has been with us on a good part of our trip, so that we consider him almost a part of our delegation, and I would feel that by now he knows a great deal about the Soviet program in nuclear physics.

With respect to the naming of Element 102, this will have to be left to the scientists involved, and it will certainly be necessary to be absolutely sure that the Stockholm work is wrong before any name is suggested.

QUESTION: Reuters. I have a very general question. In the field of the peaceful use of atomic energy, would you say that the United States and the Soviet Union are making about the same progress?

DR. SEABORG: Well, that is pretty hard to respond to in any meaningful terms. Each country has its own problems, its own needs for atomic energy. This determines to some extent the rate at which you put electrical energy on the line - on the grid - developed from nuclear energy. There is much in common between the programs of the two countries. For example, both are emphasizing pressurized water with enriched uranium fuel. The Soviet Union is on the way to emphasizing boiling water reactors, and the Soviet Union and the United States both recognize the importance of breeder reactors, and are placing a great deal of emphasis on fast neutron breeder reactors. I don't think I

could give any more meaningful comparison than that, but perhaps one of my colleagues would like to comment. Manson?

DR. BENEDICT: I think a couple of additional observations should be made, Dr. Seaborg. First of all, I believe what he may have had in mind was the broad program of research in all fields of nuclear physics, and I am sure, if you feel as I do, that many of the pure research aspects we have seen here are really outstanding. My own personal view is that the present state of research on controlled thermonuclear processes is as far advanced as in the United States. But I feel that in the area of civilian nuclear power, both in terms of the number of stations built, the number of types of reactors which have been displayed to us, and the number of kilowatt hours of electric energy generated from these stations, that the United States is well ahead.

QUESTION: Shenker, TIME. Was there any attention at all given to the use of nuclear energy for propulsion?

DR. SEABORG: We were given a complete description and saw a film concerning the nuclear ice breaker, LENIN, and as I say, we were told a great deal about the nuclear power plant. But I believe this is all that we had anything to do with concerning nuclear propulsion.

QUESTION: Did you ask whether there were any other projects concerning nuclear propulsion?

DR. SEABORG: No, I think we did not. Not that I recall.

QUESTION: Could something be said about the state of construction of the 70 BEV accelerator. I believe your group was also the first delegation to visit that.

DR. SEABORG: Commissioner Tape would be the appropriate one to mention that. He visited the site yesterday. I did not.

MR. TAPE: We had the privilege of visiting the site yesterday, and seeing the state of construction of the 70 BEV accelerator. Construction is well under way. The building for the injector, the 100 MEV linear accelerator, is well toward completion. The circular range tunnel to house the accelerator, or to house the magnets for the accelerator, the tunnel is approximately one mile in circumference, and the first quarter of it is now under construction, and portions of it are fairly well along as far as the concrete work is concerned.

The large experimental hull is also fairly well under construction, walls, roof, et cetera, and other auxiliary buildings and the area site work, and so on, are in process. We saw no equipment because none has been yet delivered to the site. It was estimated that the machines will probably be finished in approximately three years, but this is very rough.

QUESTION: Enns, Associated Press. Of all the installations you have seen, are they all more advanced than you expected, or less advanced?

DR. SEABORG: Well, I would say some were more advanced, and some were about what we expected, and some were

less advanced. I don't know that I could identify all of those categories immediately. I don't think that I personally had any very precise preconceived notion as to what the state of advancement might be.

QUESTION: Did you inspect the plasma work at the Atomic Energy Institute, and how does research compare in this field to that in the United States?

DR. SEABORG: We inspected that in some detail, and as Professor Manson Benedict indicated, that is a particular area of research, referring to the previous question, where the Soviet work is very advanced, perhaps more advanced than we expected. I could use that as an example, and it compares very favorably with the work in the United States.

QUESTION: What can you say about the time, the program and the composition of the Third Geneva Conference? I would like to know whether there is a certain agreement on that point between the officials of the State Committee and your Commission.

DR. SEABORG: Yes, I think so. We didn't discuss that other than I think one time during an automobile ride, or something of that sort. The conference is planned for the summer or early fall of 1964, as you know, under the auspices of the United Nations, but involving the International Atomic Energy Agency. The one conversation that I participated in indicated that our Soviet colleagues would want a larger conference than is being planned, and in particular, one with

more emphasis on controlled thermonuclear reactions. This is a matter, of course, that involves, as well as the State Committee and the Atomic Energy Commission, the State Department in the United States, and I don't know what other Ministry here. So it is a matter of coming to an agreement between those various agencies as to what the proper size should be. The matter of expense is, of course, an important consideration.

QUESTION: Was your visit with the Chairman of the Presidium yesterday purely a courtesy call, or were there any matters of substance discussed?

DR. SEABORG: Well, I would call it largely a courtesy call, yes.

QUESTION: You don't want to answer the second part of my question?

DR. SEABORG: No, partly because it is difficult for me to differentiate between matters of substance and no substance. I don't think I have any meaningful way of differentiating that.

QUESTION: The science of nuclear physics is a very highly classified matter, of course --

DR. SEABORG: No, not at all. So you begin with the wrong premise.

QUESTION: Nuclear science then is highly classified?

DR. SEABORG: No. There are certain narrow areas that are still classified, but in -- that is, of application --

but the field as a whole is almost completely open now, because it is a part of basic science, and I might say in justice to the premise of your question that this isn't usually realized. This is a common misinterpretation. But in all of the installations that we visited, a tremendous amount of nuclear physics was shown in the laboratories, as it will be in the United States, and as it is in all countries in the world, and it is all published in the journals, that is, this basic research, excluding, of course, these few areas of application, which is not basic work at all. That is applied science; it is engineering.

QUESTION: Grovovich, APN. The scientists all over the world are paying great attention to superconductivity, especially to receive heavy magnetic fields. What are your ideas of the possibilities of using this superconductivity in the peaceful application of atomic energy?

DR. SEABORG: Oh, I think that there are very good prospects for use in the building of accelerators, and other applications, again in the future. In the future: there is nothing of substance under construction at the present time. I would like to ask if either Dr. Benedict or Commissioner Tape or anyone would like to expand on that.

DR. BENEDICT: Well, there is one field where it makes all of the difference between the possibility of success and certain failure, and that is in the theremonuclear field,

because it would be impossible to provide the high magnetic field covering large volumes with low enough expenditure of electric energy were it not for the availability of superconductor magnets.

DR. SEABORG: I might add, since your question was general, and concerned nuclear physics as a whole, that there is much low temperature work on nuclear structure - nuclear alignment experiments - that use cryogenics.

QUESTION: Moscow News. The readers of the Moscow newspaper, and you know that the main target of this newspaper is the development of confidence in the propaganda of friendship between the peoples. I have two questions.

Are you satisfied with what you were shown here, and was the scale sufficiently large? Were you satisfied with what you have seen here?

DR. SEABORG: Yes, I meant to imply that in my opening statement.

QUESTION: The second question is, what can the scientists who are working in this field of peaceful utilization of atomic energy for the sake of principles of mutual understanding between the peoples and for the sake of peace, what can they do?

DR. SEABORG: Well, I think this agreement for cooperation is a very good example, and the visit of our delegation to the Soviet Union, and the return visit of the

Soviet delegation to the United States are excellent examples of what they can do.

SPOKESMAN: Thank you.

END

ATOMIC ENERGY COMMISSION

NEWS CONFERENCE

of

CHAIRMAN GLENN T. SEABORG

Monday, June 3, 1963

1717 H Street, N. W.

Washington, D. C.

P R O C E E D I N G S

CHAIRMAN SEABORG: Good afternoon and welcome.

I believe you know the people sitting before you here: Mr. Luedecke, the General Manager of the Atomic Energy Commission, accompanied me on this trip to the Soviet Union, and is on my immediate right. Next is Commissioner John Palfrey, further to the right.

On my left is Commissioner Leland Haworth, and then Commissioner James Ramey.

I welcome this opportunity to meet with you and discuss the trip of our delegation to the Soviet Union. I believe each of you has the text of what will be approximately my opening remarks, and I think it will perhaps be more efficient if I do run through these remarks before we open up for general questions.

First, we have listed the names of the members of our delegation. There are five of us here today, actually: Mr. Algie Wells, Dr. Arnold Fritsch, and Mr. Cecil King are sitting on the side of the room to my right.

I would like to begin by saying that our entire visit to the Soviet Union was most cordial. Our host, Chairman Andronik Petrosyants of the State Committee on the Utilization of Atomic Energy, accepted our suggested itinerary without change, and, in fact, he added a number of visits to the itinerary which was accomplished by making it more concentrated, and he expressed his regrets that we couldn't stay longer because there were a number of other places in the Soviet Union that he very much wished we could see. But nearly all of us had commitments back in the United States the beginning of this week so that we couldn't extend our stay as he would have liked to have us do.

As you know, the primary reason for our delegation's visit to the Soviet Union at this time was in connection with the formal signing of the Memorandum on Cooperation in the Field of Utilization of Atomic Energy for Peaceful Purposes. I might say our Soviet hosts conducted our tour

completely within the frame of reference established by the Memorandum; that is, within the framework of peaceful uses of atomic energy.

I might add that our delegation was privileged to be the first Western visitors, and in some cases the first foreign visitors, to visit a number of atomic energy installations. These are identified in a number of places in the release before you.

With that, let me briefly review our visit on a day-by-day basis.

As you know, of course, our delegation arrived at the airport in Moscow on Sunday, May 19th, after leaving Dulles Airport at 9:30 p.m. on Saturday, May 18th. As you also know, a number of world speed records for that run were shattered at that time, with a total flight time of 8 hours 38 minutes and 42 seconds, exactly. We were met at the airport by Chairman Petrosyants and a number of other Soviet dignitaries, including the Deputy Chairmen of the Soviet State Committee, as well as Ambassador Kohler and others from the American Embassy.

We just spent the rest of that day going in various directions, sightseeing, and most of us attended the theater that night.

The work began the following morning, Monday, May 20th, when we met to discuss with Chairman Petrosyants and his four deputy chairmen the itinerary of our visit. At the conclusion of that discussion, the group visited the Moscow State University, where we met with Rector Petrovsky and Vice Rector Vovchenko.

I might say that for that visit and all the others, we had either the chairman, Chairman Petrosyants, himself, or one of the Deputy Chairmen of the State Committee, or usually both. That was both for the visits in Moscow or the visits out of town that I am going to describe.

At this university, which is in a skyscraper somewhat reminiscent of the Tower of Learning at the University

of Pittsburgh, they have some 30,000 students, counting part-time students - some 16,000 full-time students. Classes were in session. Actually, they were having their examinations at the time we were there. We visited student laboratories, living quarters, lecture halls, libraries, and one laboratory in some detail - the cosmic ray laboratory of Professor Vernev, which is under the more detailed direction of Dr. Christianson.

After this, our group split into two parts, as we did on many other occasions, in order to cover more ground during our visit, with Drs. Benedict, Crewe, Fritsch, and Zucker going to the Institute of Chemical Physics, and the remainder of us going to the Lebedev Physics Institute. Both of these, of course, are in Moscow.

At the Lebedev Institute, we met with Director Skobel'tsyn and visited their 30 MEV Fixed Field Alternating Gradient Electron Accelerator and many of their solid state physics laboratories.

The other group met with Dr. Semenov, who is the Director of the Chemical Physics Institute, and, as you know, a recent winner of the Nobel Prize in chemistry. We visited their laboratories where they study chemical kinetics in the solid, liquid, and gaseous states, as well as in living systems.

On the morning of the next day, May 21st, the formal signing of the Memorandum on Cooperation in the Field of Utilization of Atomic Energy for Peaceful Purposes was performed by myself and Chairman Petrosyants, with Ambassador Kohler and the Deputy Chairmen of the State Committee and others present. After the ceremony, our party visited the USSR Academy of Sciences. Here we had the pleasure of meeting with President Keldysh and Vice President Millionschikov, and a number of other members of their academy of sciences, about six or eight in all. At that time, it was my honor to present to the USSR Academy of Sciences a folio commemorating the discovery of element 101, mendelevium, which was discovered at the University of California in 1955, and named in

honor of the great Russian chemist, Dr. Dimitri Mendeleev - the originator of the periodic table of the elements. Dr. Benedict and I, also, as members of our Academy of Sciences, had the privilege to present formally to Dr. Semenov, on behalf of President Seitz of the U. S. National Academy of Sciences, his certificate of membership in our Academy to which he has recently been elected.

On May 22nd, the next day, Wednesday, the delegation visited the Kurchatov Atomic Energy Institute in Moscow and met with Director Aleksandrov and members of his staff. During the morning, I gave a lecture on the Transuranium Elements to the professional staff of the institute. The Kurchatov Institute has the broadest program of atomic energy in the USSR. For example, the institute developed the nuclear power plant in the ice-breaker, Lenin, and it developed the power station at Voronezh, which I will describe later. During the course of a long day, we visited many laboratories and facilities. I won't attempt to describe them in any detail. We saw the extensive work on controlled thermonuclear fusion under the direction of Dr. Artsimovich; we saw their cyclotron, their alpha spectrometer facility and their hot laboratories where early work on plutonium was conducted. This was the first visit of a Western group to these hot laboratories. The party also visited the 2 MW(th) (megawatt thermal) IRT Swimming Pool Reactor which is the prototype for research reactors and is used in many laboratories throughout the Soviet Union, perhaps in some ten or twelve laboratories. We also saw the 20 MW(th) RPT Materials Testing Reactor which is being reconstructed at the present time.

The following day, on May 23rd, our group visited the Physical Technical Institute at Obninsk, about sixty miles south of Moscow. This site is normally closed to foreigners, although former Chairman McCone and his group, when they visited the Soviet Union on a similar mission in October 1959, visited this institute. Here we met with Director Rodionov and his staff. The site and the institute are largely concerned with the development of nuclear power plants of two types: the sodium cooled fast reactors and the graphite-moderated, superheat, thermal

reactors. The Obninsk site is responsible for the design of the larger 100 MW(e) (megawatt electrical) graphite-moderated, superheat reactor being built in Beloyarsk, some 1,000 miles east of Moscow.

We did not visit Beloyarsk, but the director of Beloyarsk, Orlov, was at Obninsk to describe this reactor to us in great detail. This reactor is expected to go critical by the end of this year. This reactor is, by the way, very similar to a reactor being designed in this country by the Westinghouse Company, known as the SCOTT-R Reactor. That is just the initials for Super Critical Once Through Tube Reactor, the SCOTT-R. This is a rather advanced type that is just being designed by the Westinghouse Company.

During our tour at Obninsk, we saw many of the laboratories doing physical studies and we saw in great detail their laboratory for handling liquid sodium and liquid sodium-potassium. I might say this was also the first time that this work was shown to any Westerners. We also visited the 100 watt(th) BR-1 fast reactor and the 5 MW(th) BR-5 fast reactor. I should say both of these are fueled with plutonium - i.e., plutonium oxide. We visited their fast critical facility and the 5 MW(e) AM-1, the first nuclear power station in the Soviet Union, which was built in 1954 and has been operating essentially continuously ever since. Our delegation was the first Western group also to visit the 1.5 to 2 MW(e) mobile reactor also at this site. This is a reactor that they can take apart and move on about three or four trucks - four trucks.

On May 24th, our delegation was flown in a chartered aircraft to Ulyanovsk, the birthplace of Lenin. We did stop by to see some of the historic sites in that connection. Ulyanovsk is a city 500 miles east of Moscow on the Volga River. Then we drove about another 60 miles further east to New Melekess, the site of the Scientific Research Institute of Atomic Energy Reactors. This is the site that was started - where construction started - in 1959. Again, we were the first foreign visitors to the site and the town.

At this site, we discussed their program with Director Yurchenko and his staff. We toured their various facilities now under the first stages of construction, including extensive hot laboratories for the study of metallurgy and chemistry. These laboratories are probably more extensive than any that we have in the United States. That is, they will be when they are completed. We saw them as the work - the construction work - was under way.

The reactors visited were the 50 MW(th) SM-2, which presently has the highest thermal neutron flux of any reactor in the world. I might say this was constructed in near record time. The construction there began in 1959 and it went critical in 1961, and was operating at full power toward the end of 1962. We saw also the 1 MW(e) organic-moderated and cooled reactor experiment. This has the name ARBUS, meaning Nuclear Reactor in Block Assembly. This was also a transportable reactor. We saw the site of the 50 MW reactor - we saw the building, I should say. We climbed up at least ten or twelve stories to the top of the building, where the 50 MW(e) Boiling Water Reactor is under construction. We also saw the foundations for a 75 MW(th) materials testing reactor that is being constructed on that site.

I should say here that our hosts made another exception for our trip in that they showed us on numerous occasions reactors under construction. That is, this is something they haven't wanted to do in the past, and this gave us an opportunity to examine reactors in some instances, of course, much more closely than has been the opportunity in the past.

The following morning, May 25th, we left for Leningrad by scheduled airline, and upon our arrival there we again split into two parties. One group, consisting of Crewe, Ghiorso, and Zucker, visited the Physical Technical Institute and met with Director Konstantinov and his staff, and they toured the laboratories and experimental facilities, including the 100 Mev synchrotron accelerator and the 10 MW(th) research reactor.

The second group, including myself, visited the Khlopin Radium Institute. We were the first Westerners to visit this institute since the war. This is a historic laboratory, being the first institute established in the USSR, in 1922, specifically for the study of radioactive substances. It is now headed by Director Vdovenko.

Our group was given an extensive tour of the many laboratories, devoted to nuclear physics, the chemistry of the heaviest elements, and other related areas. We were privileged to see there the first cyclotron built in Europe in 1935. This machine is still operating. It is the oldest operating cyclotron in the world, although, like all old equipment, it will soon be dismantled when the institute moves completely into new quarters.

We saw their work in two buildings, their old building, and then a very new building that has been under construction for the last two years, a mile or two away, where they will eventually move entirely, I gather.

The two groups then rejoined for a visit to the Scientific-Technical Institute for Electro-Physical Apparatus, headed by Director Komar. This institute is responsible for the design and project management of most of the particle accelerators built in the Soviet Union, as well as some of the controlled thermonuclear devices.

I might say that their approach to the building of high energy accelerators is different than ours. We in the United States tend to place the responsibility for the design in the various laboratories where they might be used. They design and in many cases construct, although they use industry in the construction process, essentially all of their accelerators through this Scientific-Technical Institute for Electro-Physical Apparatus. This, they feel, gives them a greater efficiency, particularly in reproducing an accelerator that might be used in a number of places in the Soviet Union. For example, there we inspected a 1/15th scale

working model for a 100 Mev isochronous, 100 Mev protons that is, isochronous cyclotron, which then will be built for installation in a number of laboratories throughout the Soviet Union, including, by the way, the Radium Institute, just across town. We also inspected a 5 Mev electron accelerator which will be widely build and produced for use in medical applications.

The next day, Sunday, was spent in sightseeing, visiting the Hermitage, a ride on the harbor and so forth. Then that evening most of us departed by plane for Moscow, where we boarded an overnight train for Voronezh, about 400 miles south of Moscow on the Don River. But three of our party, Crewe, Ghiorso and Zucker, flew directly to Kharkov.

Upon our party's arrival in Voronezh, on May 27th, Monday, we went, via a spur line, to Novovoronezh, a new community built near the site of the 210 megawatt electrical pressurized water reactor that is now being finished by the Soviets.

This reactor, under Director Chepak, is similar to those in this country; that is, to the pressurized water reactors, like the Shippingport PWR and the Yankee Atomic Power Station. The reactor is expected to begin operation in about one-half year.

I might say that we spent a long time, a couple of hours, inspecting this in great detail, climbing up and down and through long tunnels where they had the various piping and so forth. I think after about two hours of this they still had a great deal more to show us, but this was about as much as our energies would allow and as much as our time would allow. But it was an example, again, of their showing us something under construction so that we could see it in greater detail than we might otherwise.

After this all-day visit, the delegation re-embarked on the train and returned to Moscow. Meanwhile, also on Monday the 27th, the other contingent of our delegation, Crewe, Ghiorso and Zucker, visited the

Physical Technical Institute at Kharkov under Director Sinenlikov. This is a site, this is an institute, devoted to the construction and use of linear accelerators of various kinds. They have a large number of linear accelerators there. The group saw many of the linear accelerators at this time, including the 2 Bev electron accelerator under construction. The group was the first Western delegation to see this facility.

This group also took an overnight train in returning to Moscow.

The following morning, May 28th, we all reunited for a visit to the Joint Institute of Nuclear Research at Dubna, about 70 miles north of Moscow, and there we met with Director Blokhintsev and his staff. The delegation visited there the 10 Bev accelerator, the heavy ion cyclotron, being used for work on the transuranium elements, including having been used for the discovery of the new isotope of element 102, and we visited the pulsed fast reactor.

This site, of course, is international in character and has been visited by many groups.

The next day, May 29th, saw our delegation again splinter into groups. Ghiorso returned to Dubna for further discussions on transuranium research and Crewe, Luedecke, Tape and Zucker visited Serpukhov, the site of the 70 Bev accelerator, about 65 miles south of Moscow.

This, by the way, is the first time that this site has been visited by a Western delegation.

This accelerator is still in the early stages of construction. When finished, it will be about one mile in circumference and the highest energy particle accelerator anywhere in the world. I believe they estimate about 1965 or 1966 - actually 1966 for that completion.

I had the opportunity, on May 29th, to pay a courtesy visit to L. I. Brezhenev, Chairman of the Presidium of the USSR Supreme Soviet. It was a cordial

meeting which was limited to the delegation's frame of reference.

Following this, I visited Dr. Yelyutin, Minister of Higher and Specialized Secondary Education, to discuss matters of mutual interest.

I might say that I haven't added here any description of the many fine spreads of food that we saw in each of these sites; sometimes two or three times during each visit. And I haven't added any descriptions of our various visits to the theater and football games and so forth during the evenings.

The delegation's visit ended with a press conference on Thursday morning, May 30th, and then that afternoon we proceeded to Sheremetyevo Airport, with Chairman Petrosyants and his staff and Ambassador Kohler to see us off, and returned to the United States on May 31st.

I might say - this just occurred to me - that a large number of pictures were taken of the groups at all of the sites by our Russian hosts, and prints of these were ready for us by the time we left. It occurs to me that some members of the press might be interested in seeing those. Why don't we bring those in and put them on the table. They can look at them afterwards, if they wish.

That is all. Thank you very much.

QUESTION: Dr. Seaborg, it seems that the Soviets were very open in what they showed you. Do you have any observations on why they were so open in everything they showed you, particularly the new reactors under construction which they hadn't showed you before?

CHAIRMAN SEABORG: I, at one stage, or at a couple of stages, talked to them along these lines, and they indicated that it was because of their desire to do everything they could to make our agreement for cooperation in the peaceful uses of atomic energy work; that they wanted

to be sure that they were going as far as they could in order to make it successful.

QUESTION: Mr. Chairman, did your visit enable you to get any feel for their state of nuclear rocket development as compared to our own?

CHAIRMAN SEABORG: No, none whatsoever. We never touched on that subject.

QUESTION: Could you, from your visit, evaluate their reactor technology versus ours, and their synchrotron work versus ours?

CHAIRMAN SEABORG: I would have to respond in some detail. Their pressurized water reactor at Voronezh would compare favorably with ours. Perhaps in some ways it was designed even more conservatively than some of ours.

I might also interpolate here that they hope to have this reactor go on up to 1,000 megawatts electrical in its later stages.

The first version that we saw under construction at Voronezh was 210 megawatts electrical, but they already have plans or have almost started construction of a second stage which would develop a power of about 350 megawatts electrical, and then, as I say, they plan to go on up to 1,000 megawatts electrical, where it would begin to be economically competitive with the cost of power from conventional sources in high cost areas, the same term that we have used many times.

That type of reactor would be scaled up to 1,000 megawatts electrical in later versions.

I haven't really answered this question yet. Their work in particular instances like that is about comparable with ours. On the other hand, they do not yet have, on the line, developing electricity, reactors of that type. This reactor is supposed to go on the line by the end of this year.

We have had the Shippingport reactor going for a number of years, and the Yankee Atomic Station, and so forth. They are just building the boiling water reactor, as I told you, and we have the Dresden reactor that has been operating for a couple of years. This may be in part a matter not so much of our being ahead of them as the matter of the amount of emphasis that they have placed on atomic power. They are not short of power. They have coal and gas, and plenty of undeveloped hydro power, especially in Siberia.

We also are developing a larger number of different kinds of reactors than the Soviets. So my answer to your question has to be somewhat complicated. I hope it has been helpful.

QUESTION: Sir, take the matter of nuclear accelerators. We know they have emphasized those. They got the Dubna thing on the line in 1957, I believe. I heard that was a white elephant from the day they got it. They never did anything with it. Now they are building this other machine, again with a value that seems to have been selected just to top us.

What have they accomplished in high energy physics?

CHAIRMAN SEABORG: I said that the 70 Bev accelerator that they will have at Serpukhov, beginning about 1966, will be the accelerator furnishing the highest energy particles by quite a margin for a number of years.

With respect to what they have accomplished with the 10 Bev accelerator at Dubna, perhaps Commissioner Haworth would like to make some observations.

DR. HAWORTH: I think your expression of "white elephant" was nearly correct for a while. They made some technical mistakes in design which they have now straightened out. It is now a useful accelerator, though not of as high intensity as accelerators in this country. It, of course, was simply a blowing up of the design of the Bevatron. In a photograph it looks almost like the Bevatron. Similarly, the 70 Bev machine will be more or less a larger version of the Brookhaven AGS.

QUESTION: Will 70 Bev be useful or meaningful?

DR. HAWORTH: It is twice as much as the AGS, or a little more.

CHAIRMAN SEABORG: I think the answer has to be "We don't know." You are always in a good position if you have more energy than anybody else in the world.

DR. HAWORTH: That is right.

But there is no known qualitative thing that we can predict.

QUESTION: To take this in a general context, do you come back with the impression that we are ahead or behind them in specific areas, such as controlled thermonuclear research, reactor technology, high energy physics?

CHAIRMAN SEABORG: I would have to, as I said, respond in some detail. In controlled thermonuclear work, their situation compares very favorably with ours. Their recent results, for example, are probably as good as anything we have done in the United States. And they have a very extensive program there.

I would estimate that it is more extensive than ours. That is, that their budget for work in controlled thermonuclear power is larger than our budget.

In civilian nuclear power, as I tried to indicate, the reactors that we have seen under construction are well built, probably as well built as ours. However, we have reactors of approximately the same type that we have had on the line for a number of years. We have more power on the line. This is partly due, I would surmise, to the degree of emphasis that they have placed on this, their determination as to when they really need civilian nuclear power.

Then, as I indicated, we have a broader program. We have a larger variety of reactors under development in the United States.

With respect to high energy nuclear physics, I would say that, as is well-known, the work in the United States has been for a number of years more fruitful or has led to more significant results or more important discoveries in the field of new particles and so forth than the work in the Soviet Union.

QUESTION: Mr. Chairman, you used the expression a couple of times "compared favorably." Does that mean that it would be superior in any case?

CHAIRMAN SEABORG: I don't know that I would want it to be taken as meaning superior in the case of controlled thermonuclear work. I mean really that they are comparable. I don't know, and I don't believe anybody knows. I think it is hard to define. For example, if you use the criterion of the concentration of plasma that they have received, times the time; i.e., multiplied by the time, I believe that we have achieved even now higher values of that product than anybody in the Soviet Union. On the other hand, this recent result of Artsimovich, where he has confined plasmas for up to about thirty milliseconds, is an impressive result. There is no precise measuring scale whereby one can say which side is ahead in a case like that.

QUESTION: Mr. Chairman, did you see or hear anything about the much rumored nuclear aircraft or submarine, and why do you suppose it was that you did not see the icebreaker?

CHAIRMAN SEABORG: Two questions. We didn't hear anything about a nuclear powered aircraft. I think if we had asked possibly we might have learned something. Nuclear submarines were outside of the purview of the exchange, obviously. That is a military application. So far as the icebreaker is concerned, I believe if we had asked to see that, we would have been allowed to. Chairman McCone and his party saw the icebreaker, and Admiral Rickover has seen it. So I do believe that if we had asked to see that - we, for example, were shown the fuel elements that go into the icebreaker, the actual models of the fuel elements, and given the

composition and their cladding and their dimensions, and everything of that sort. Every question that we asked with respect to the composition and the physical configuration of the fuel elements for the icebreaker was answered.

QUESTION: Are they having as much trouble with that icebreaker as we are with the Savannah?

CHAIRMAN SEABORG: Not of the same type, no.

QUESTION: Did you see anything that would make you want to change the direction of our program or add to it; for instance, asking for more money for fusion research, or setting up a mass production particle accelerator plant?

CHAIRMAN SEABORG: The answer to both of those examples is no. I think that the level of work in controlled thermonuclear fusion in the United States, which is about 25 million dollars a year, is about right. My personal opinion is that so far as the design of accelerators is concerned, that the method of having it centered in the laboratories where they are going to be used and more under the direction of the scientists who are going to use them is probably a better method of doing it. This is debatable.

DR. HAWORTH: Every Russian accelerator designer except in the Komar Institute would agree with you. They don't like it at all.

QUESTION: Is that the reason why the Dubna thing failed so disastrously in its early years?

CHAIRMAN SEABORG: You can't necessarily spot it that way, but it certainly is true that to have the users intimately in on the design of the accelerators is very important.

QUESTION: Did you hear any of the users sniping at this Serpukhov arrangement, saying that they thought that would be a dog, too?

DR. HAWORTH: They don't like the general idea. If you can get them over into a corner, they will tell you that they don't like it.

QUESTION: Why is it that you didn't want to talk about or ask them about the nuclear airplane? Was it because you didn't think the rumors were founded?

CHAIRMAN SEABORG: It just didn't occur to me. We asked them all the questions that we thought about, that we thought were within the purview of the arrangement.

QUESTION: Do you give credence to these reports?

CHAIRMAN SEABORG: No, I don't. I personally don't give credence to the reports that they have a nuclear airplane. I haven't anything to go on there, other than just my basic understanding of what is involved in building a nuclear airplane.

QUESTION: Dr. Seaborg, medical uses are covered by the agreement, and yet you neither asked for nor saw any medical applications?

CHAIRMAN SEABORG: We could have asked. I would say that perhaps one of our first exchanges of a group of scientists under the agreement should be in the field of medical uses. This was just an exploratory - this was a first - trip in which we asked to see these various installations that I have recounted. I am sure we could have seen medical uses and installations involved in medical uses if we had requested, and, as you say, it is part of the agreement. One of our exchange visits with a group of specialists surely should be in that field.

QUESTION: Dr. Seaborg, what impression did you come back with about the administrative efficiency of the Soviet atomic program? I ask this because your predecessor when he came back from his trip was very much impressed with the Soviet ability to go from the decision to construction, in contrast to our rather prolonged red tape.

CHAIRMAN SEABORG: They can probably pick out a particular project and construct it faster than we can. But I don't think that overall I would rate their efficiency as higher than ours. It is very difficult to make a rating. But they can probably take a particular project and build it faster.

QUESTION: Dr. Seaborg, did you note any discussion with your Soviet colleagues about problems of allocations of funds regarding peaceful uses of energy versus military? Was there any griping about it?

CHAIRMAN SEABORG: No, I didn't hear any versus the military. I think there was the usual good natured banter about needing more money to carry on their work - by some of the scientists - but no comparison with the military budget that came to my attention.

QUESTION: How about their space program?

CHAIRMAN SEABORG: We weren't concerned with that at all.

QUESTION: General griping, I am talking about.

CHAIRMAN SEABORG: No, as a matter of fact, I didn't hear any. Maybe a joke or two.

QUESTION: Will you tell the jokes?

CHAIRMAN SEABORG: No, I meant a joking reference on the scientist level to the fact that they have competition with the space program.

QUESTION: Dr. Seaborg, did the test ban treaty come up at all in any of your private discussions?

CHAIRMAN SEABORG: No, it didn't.

QUESTION: Doctor, this new agreement is wider than the old one in that it covers research specialists for as long as a year. Could you tell us when the first research specialist might be exchanged or otherwise amplify on that part of the agreement?

CHAIRMAN SEABORG: We haven't begun to discuss any of those details with the Soviets, and perhaps won't until after their return visit. Chairman Petrosyants - I will immediately extend to him an invitation to come over to America with a delegation for a reciprocal visit. I would suspect that that would take place this fall. Perhaps that would be the time when we would begin to investigate specific exchanges under the agreement.

QUESTION: Dr. Seaborg, could you ever clear up the mystery of where that reactor somewhere in Siberia is located?

CHAIRMAN SEABORG: No, we didn't.

QUESTION: Did you ask?

CHAIRMAN SEABORG: We didn't ask, no. I think that reactor may be connected with production, a dual purpose reactor. So we didn't ask.

QUESTION: Did you find yourself being careful about asking questions for fear you would push them too far, or did you ask questions that you were denied answers to?

CHAIRMAN SEABORG: I don't know that we were consciously under constraint. We didn't, deliberately, ask questions in the military field, if that is your question.

QUESTION: Do you expect to show the Russian delegation some things that you haven't shown them in the past, to match the expanded amount of things that they showed us?

CHAIRMAN SEABORG: I think that the number of visits of Russian scientists to discuss our unclassified peaceful nuclear power plants has been so small that it will be quite natural and easy and straightforward to show them things that Russian scientists haven't seen before in our program, within the purview or the confines of the agreement.

QUESTION: Mr. Chairman, after what you have seen over there, do you think there is any reason to declassify some of our classified reactors and other projects?

CHAIRMAN SEABORG: No, we didn't see anything over there that would be classified in this country. So I don't think so. I think we are operating under a very good level of openness and of declassified work.

QUESTION: How do they appear to be doing, Mr. Chairman, in small reactors suitable for space work, something comparable to our SNAP program?

CHAIRMAN SEABORG: We don't have any knowledge of that at all. That hasn't been revealed, to my knowledge, by the Soviets, if they are working in this field, on any occasion.

QUESTION: Dr. Seaborg, what discussions did you have, if any, on the possibility of a joint construction of a very large accelerator, such as a 1,000 Bev machine?

CHAIRMAN SEABORG: Nothing official. I think on one occasion on an automobile trip between these sites or from the city to a site, sometimes you know these were 50 or 70 miles, we discussed this a little bit. I mentioned that we had an interest in this. However, the program had been slow in our negotiations. I said that we perhaps had a continued interest in it. The men that I was talking to also indicated that they had a continued interest in it, but nothing more than that.

QUESTION: You said, sir, that you thought they had a larger budget than we do on the thermonuclear side of the business. Do you think overall that they have a larger budget than we do on the peaceful uses of atomic energy?

CHAIRMAN SEABORG: I don't know. Some of these research institutes are very large, and there are quite a number of them. But it is difficult for me to estimate. I would say that it is probably comparable. I would be interested in any estimate that any of my

colleagues might make. We don't have too much to go on there.

QUESTION: Do they seem to know what we are doing?

CHAIRMAN SEABORG: What did you say?

QUESTION: Did these people seem to know our progress?

CHAIRMAN SEABORG: Yes. They are quite familiar with our progress. Of course, we discussed the whole gamut from basic science to engineering and applied civilian power. But, depending on the scientists that we were talking to, I would say in general that the various specialists were familiar with American work. They read the literature very carefully.

QUESTION: Did most of the scientists speak English to you, or was it through translators? Or did a great number of them?

CHAIRMAN SEABORG: The scientists - perhaps half - spoke English. The engineers at these various reactor sites that I have mentioned - perhaps less than half. I think we used an interpreter more than half the time, particularly at the outlying plants, like Obninsk, or Voronezh, or Ulyanovsk.

QUESTION: From your conversations, did you gather that the Soviet Union has gone through a period of reappraisal and perhaps de-emphasis of its civilian power program?

CHAIRMAN SEABORG: It was difficult to tell. The indications were that at the present time they have a very serious program and that they regard nuclear power as economically competitive in high cost areas, and by high cost areas they mean Central European Russia, not Siberia. I don't know that there are any areas in Siberia where it is economically competitive. They quoted prices for energy in Siberia that were, I might say, spectacularly low, both from the standpoint of

undeveloped hydro power and from the standpoint of availability of coal. But I had the impression they are very serious about it in Central European Russia, that it will play a role and that they plan to build up quite a program there.

QUESTION: As the discoverer of plutonium, do they know as much about plutonium chemistry and fuel technology as we do?

CHAIRMAN SEABORG: We didn't discuss that in very much detail. As I indicated, they showed us the hot laboratories, the original hot laboratories. Probably one of those was the laboratory where they handled their original plutonium, by the way, as a matter of interest. But we didn't at any time get into a discussion at any real level of detail on plutonium metallurgy or plutonium in general. Of course, the chemical processing is not part of the exchange agreement, nor have the Soviets yet revealed to us how they carry on their chemical processing or their fuel reprocessing, or where the chemical fuel reprocessing plants are. That information has not yet been revealed.

QUESTION: Dr. Seaborg, the Ramsey recommendation visualizes a U.S. high energy accelerator program of something like $8 billion through 1981 or 1982, with a 200 Bev machine and then an 800 Bev machine. Did you get any feeling at all that the Russians were even seriously breathing on our heels in high energy physics?

CHAIRMAN SEABORG: For the next step beyond 70 Bev?

QUESTION: For the next decade or two. From the prestige standpoint, is there any real drive on this country to go beyond --

CHAIRMAN SEABORG: As I say, they have it, in a sense, built into their program from a prestige standpoint because for some four or five years after 1966 they will have the highest energy accelerator in the world.

QUESTION: They had one of those things for years before we got the AGS and they didn't do anything with it.

CHAIRMAN SEABORG: I am not an expert in this field, but it would be my guess that this one probably will operate from nearly the beginning and will be effective.

QUESTION: Dr. Seaborg, did you get to see Dr. Kapitza or Dr. Pontecorvo, and if so, will you tell us about it?

CHAIRMAN SEABORG: No, I didn't see either one of them. But, on the other hand, I don't believe either one of them would have been naturally at any of the sites, or apparatus at the sites, that I asked to see.

QUESTION: You said the scientific work was pretty comparable and you also got quite a bit into the countryside away from Moscow. Can you tell us whether or not they have come along in their road building and things of that sort? Is that anything comparable to what ours is? Just what was your general impression of the development of their country, roads, hotels, trains?

Missile sites?

CHAIRMAN SEABORG: Well, we didn't travel over a large number of roads. As is well known, the roads in the Soviet Union are not comparable with ours. I must say that so far as the cities are concerned and the hotels are concerned I think the whole delegation was impressed by what I might call the western atmosphere of Leningrad. It is a city much more like other European cities than the other cities, even Moscow, in the Soviet Union. The few occasions that we traveled long distances on roads they were paved roads but usually two lane, I mean one lane each way, and not as smooth by any means as the roads in our country.

QUESTION: Dr. Seaborg, when you mentioned that their pressurized water reactors were designed perhaps even more conservatively than ours, were you talking about small generating capacity or greater safety features, especially the one at Voronezh?

CHAIRMAN SEABORG: Not exactly safety features, but features that were sort of back-up features to insure successful operations. I wouldn't say that they have the safety features that are equivalent to ours. For example, their reactors don't have the containment, the outside containment, that we require in our reactors. You know, the familiar spherical containment and so forth. They depend there on an ordinary concrete building with windows and so forth. I had more reference to just back-up features, additional valves and so forth, to be absolutely sure of the technical performance of this first reactor. They themselves indicated that they probably will eliminate a number of these in the second reactor, but they were being very sure that the performance of this reactor will be up to specifications.

QUESTION: Did you discuss at all with the top scientists you met the role of the Communist Party in their work? Did they interfere with them? You were there during the height of this vigilance campaign on spying and secrecy. Did you find any uneasiness?

CHAIRMAN SEABORG: No, we didn't. Ambassador Kohler gave a reception for our delegation last Tuesday night at the Embassy, and despite some of the vigilance that was advocated, as you say, in the Soviet newspapers, the turn-out for the reception was very good and the atmosphere was extremely friendly, so friendly that I believe Ambassador Kohler commented upon it to a number of us, and indicated that it didn't seem to reflect the new policy at all.

QUESTION: Dr. Seaborg, you mentioned the highest thermal neutron flux of any reactor. Did it appear to you that the rewards from building that reactor measured up to the estimates of some of the people in our country who pushed to get such a reactor? That is the 50 MW(th) SM-2, presently the highest thermal neutron flux of any reactor?

CHAIRMAN SEABORG: Yes, it will be the reactor with the highest thermal neutron flux until a reactor or two that we have under construction become operable.

QUESTION: What was that flux?

CHAIRMAN SEABORG: 2.2 times 10 to the 15th neutrons per square centimeter per second. We will have a reactor, the High Flux Isotope Reactor, for example, being built at Oak Ridge, which will become operable in about two years, which has a flux of 3 to 5 times 10 to the 15th neutrons per square centimeter per second. We also have the Advanced Test Reactor under construction at Idaho, which will be in the range of 1 or 2 times 10 to the 15th.

QUESTION: Did you get the impression that the engineering on their reactors, including the conventional parts, is as good as our engineering? I ask this because some of the past people have come back and suggested their engineering is not up to ours.

CHAIRMAN SEABORG: I would say that on the Voronezh reactor, and it depends on how you define engineering, that we probably do the same job with somewhat more sophistication. That is, we don't seem to need some of the back-up devices to insure good performance, and probably do the job generally with somewhat more sophistication.

QUESTION: What do you foresee as the first results of this agreement on the exchange of scientists when it becomes fact? What do you expect it will become?

CHAIRMAN SEABORG: What do you mean, foresee the results?

We hope that there will be implementation through a number of visits of delegations and exchange of scientists for work in the laboratories for these periods of six months to a year. I think that this will advance both our programs in basic research and in civilian nuclear power and, I hope, contribute a great deal to good relationships between the scientists of our countries and between our countries.

QUESTION: Will there be any joint projects?

CHAIRMAN SEABORG: Did you say will there be any joint projects?

QUESTION: Construction or experiments or research?

CHAIRMAN SEABORG: I think that some of the work in basic research can be almost defined as joint projects. Yes, sir. That is, that scientists who will visit in the laboratories, Soviet scientists in this country and our scientists in the Soviet Union, will participate in what might be called joint projects. Yes, sir.

QUESTION: Could you give us an example?

CHAIRMAN SEABORG: One that has been suggested might be in the transuranium field, in the search for heavier elements or further work on element 102. I think many other examples could probably be given, certainly in the field of high energy nuclear physics. Perhaps visiting scientists from the Soviet Union and vice versa would work on elementary particle physics.

QUESTION: How many scientists are likely to be involved in this exchange?

CHAIRMAN SEABORG: Which exchange? The exchange of delegations for short visits?

QUESTION: No, the exchange with specialists.

CHAIRMAN SEABORG: The agreement contemplates the exchange of one or two scientists in each of three fields, nuclear power and controlled thermonuclear reactions, and, I believe, high energy nuclear physics.

I would say at a maximum we might exchange scientists in all three of those fields, say within the period of two years or something of that order - just guessing as to how well and how expeditiously these exchanges will be carried on.

QUESTION: Did you talk at all about underground nuclear explosions of the Plowshare type or for very basic research in the high flux environments?

CHAIRMAN SEABORG: No.

QUESTION: Nothing at all involving the actual ignition?

CHAIRMAN SEABORG: The actual ignition of a nuclear device?

QUESTION: Well, like Plowshare.

CHAIRMAN SEABORG: No, except that in my talk at the Kurchatov Atomic Energy Institute on May 22, I indicated our plans for Coach and so forth, and predictions of what might happen if we had a successful experiment there.

QUESTION: What effect do you think negotiations like this may have on test ban talks?

CHAIRMAN SEABORG: I don't know. I don't foresee any particular effect unless it is one of improving relations generally. Other than that, I don't see any effect.

QUESTION: Did what you saw in Russia have any surprises for you? Anything you didn't expect?

CHAIRMAN SEABORG: I don't think most of our delegation had enough of a preconceived notion to enable us to decide whether there were real surprises. I would say, and, again, this is a matter of detail over a wide, wide spectrum, I would say in my own case perhaps their heavy ion accelerator at Dubna was more powerful, more versatile, particularly with respect to the plans they have for the future for bringing the beam out, than I had expected. Perhaps the speed with which they built the very high flux reactor at Ulyanovsk was somewhat of a surprise. Those are perhaps two instances.

THE PRESS: Thank you very much.

CHAIRMAN SEABORG: By the way, here are the pictures for those of you who just want to see them.

DEPARTMENT OF STATE

TRANSCRIPT OF JOINT BACKGROUND PRESS AND RADIO NEWS BRIEFING

WEDNESDAY, January 8, 1964, 3:00 p.m.

MR. MANNING: Ladies and gentlemen, we want to start right on time, because the two Secretaries and Dr. Seaborg have only a half hour. They have a meeting upstairs.

The ground rules for this are BACKGROUND; that is, that this is attributable to US or official US sources. And we are here primarily to discuss the foreign policy aspects, and in particular the part of the State of the Union message dealing with the cut-back on the production of fissionable materials.

I think Secretary Rusk, Secretary McNamara, and Dr. Seaborg may each like to make a very brief opening comment, and then open themselves to your questions.

Now, Mr. Secretary.

SECRETARY RUSK: Thank you, gentlemen, I know that this is a very busy day for you as well as for us, so that I will move right along. I am happy to have a chance to take advantage of Secretary McNamara's and

Dr. Seaborg's presence here in the Department today, to have this joint backgrounder on the State of the Union.

It is, as you will have observed, short, and is aimed primarily at the legislative proposals which the President has or will have before the Congress.

I would caution you, however, in supposing that the foreign policy aspects of the speech are only those contained, say, in Paragraph 8, because a great deal of the rest of it has to do with foreign policy matters. The fate of the Civil Rights legislation, e.g., in this country is a matter of the greatest importance to foreign policy, and the kind of country we are, and how we deal with our problems here at home, have a lot to do with our relations with the rest of the world.

Now, on the foreign policy side specifically, the section is short but quite comprehensive. I think that you will recognize most of the elements there. On the disarmament side, you have and we have learned that formal agreements in this field are extremely difficult to reach, because formal agreements have to be written against the prospect of violation. That does not mean, necessarily, however, and I emphasize necessarily because we cannot be certain--that does not mean that necessarily

there is an unlimited arms race. In the last three years--or reaching well into the future — in the last three years, we have added very substantially to our defense budget. It may be possible for the principal powers to make their own decisions in the light of what the others are doing. And therefore it may be of some consequence that at least two of the principal powers are not adding 10 or 15 per cent to their defense budgets this year, based on the best information that we have available.

Ours is leveling off and turning down slightly. This is not based upon any agreement or understanding with anyone else. But it is taking into account what the other side seems to be doing, and we hope very much that this leveling off and slight turning down will itself stimulate similar steps on the other side as well.

We will be going to Geneva January 21, with a complete review of the disarmament situation. We hope we will be able to make some new suggestions at that meeting, and that those will be picked up by the conference and open the way for us to move ahead.

But I'd like to first give Secretary McNamara and Dr. Seaborg a chance to comment, particularly on

Paragraphs 1 and 2, which have to do with some of our weapons problems.

Bob?

SECRETARY McNAMARA: Good afternoon, gentlemen. I will comment initially only on the proposed cutbacks in enriched uranium production and plutonium production.

During the past three years, our inventories of nuclear warheads have increased by approximately 50 per cent. We now have tens of thousands of such weapons in our stocks. Based upon the Defense Department's five-year program, we have estimated our requirements for such weapons for the future.

It's clear, I believe, that the rate of increase in the stockpile required in the future will be less than that for the recent past. And therefore the production of enriched uranium and the production of plutonium can be cut back without in any way reducing the strength of our military forces.

I will be happy to elaborate on this subject later. But that's all I will say at this moment.

SECRETARY RUSK: Doctor?

DR. SEABORG: Good afternoon. What I am going to say is, or what I might say is summarized in this statement that I believe has been issued.

The President said in his State of the Union message that the production would be 25 per cent in enriched uranium, and/the decrease in production would be 25 per cent in enriched uranium and the plutonium production would correspond to the shutting down of 4 plutonium reactors. I have elaborated in some detail what this means.

It means in the case of the four plutonium-producing reactors, 3 at the Hanford, Washington, complex, and 1 at the Savannah River complex, the three at the Hanford complex to be shut down beginning in January 1st of 1965, and extending to the end of Fiscal 1965; that is, to July 1st, 1965, and the one at the Savannah River complex to be shut down on July 1st of 1964.

The reduction in 25 per cent in the enriched uranium production would be divided in a manner yet to be determined between our 3 production complexes, the one, the gaseous diffusion plant for the enriched uranium at Oak Ridge, and the one at Paducah, Kentucky, and the one at Portsmouth, Ohio.

I also give in my statement some of the details

as to the effect on the employment at these various places, and additional background material having to do with the plans that the AEC has been making over some period of time in order to lessen the impact of these reductions.

So I think with that I won't say anything more.

SECRETARY RUSK: Are there questions on this point?

Q I'd like to clear up the time element, if I may, Mr. Chairman. As I understand the President's message, he was talking about this fiscal year, which I took to be Fiscal '64. You are talking about a later period in your statement. Which is correct?

DR. SEABORG: The President was talking about Fiscal '65. And these reductions to which I referred are for the period Fiscal '65; that is, July 1st, 1964 through July 1st, 1965.

SECRETARY RUSK: John, my guess is that what has happened is that this whole message was about Fiscal '65, and in your preparation of the--

Q When he referred to this year, then, he meant--

SECRETARY RUSK: It was a preoccupation with

the budget and the budget situation in Fiscal '65, and I think that little confusion on this point was an inadvertence, quite frankly.

Q Sec. McNamara, if the stockpile situation is such that you are getting a leveling off or tearing down in the need for fissionable material in the coming fiscal year, and the budget, military budget is leveling off or going down, what is the prospect, looking ahead three, five, ten years? Is the requirement in the AEC, and therefore the AEC budget, going to go substantially down? There has been talk of as much as a billion dollar cut eventually in the AEC budget.

SECRETARY McNAMARA: Well, I think that the Chairman will wish to comment on the AEC budget, but let me speak more generally to your question: What is the outlook for defense expenditures in the future?

Q On nuclear weaponry.

SECRETARY McNAMARA: First, perhaps a little more broadly, and then more specifically with respect to nuclear weapons. I think that barring a substantial change in the international situation, we should expect that with the economies that the President is emphasizing, with the elimination of whatever waste remains in the defense system, we should be able to reduce the percentage of the gross national product of this country devoted to

defense.

How much that will be, I don't care to say or quantify today, but I think we can look to a gradual reduction, certainly in relative terms, and I am even hopeful that there can be some continuing reduction in absolute terms, and I say this despite the fact that the increases in the pay rates of military and civilian personnel in the Department, plus the increases in the retirement payments thatwill necessarily occur in the future, will add between, say, Fiscal Year 1962 and Fiscal Year 1967 close to $3 billion per year to the defense budget.

Now, an important element in the budget structure leading to the results I have just outlined, is the reduction in the absolute expenditure required in our nuclear forces. We have had a huge increase in those forces in the past three years. This represents the initial capital investment, if you will, required to in effect introduce into those forces a completely new power, the power represented by our intercontinental ballistic missile forces, and the public should expect and I think the public will see a gradual decrease in

the absolute expenditures on those forces.

That means a decrease in the expenditures for the weapons systems themselves, and of course it means a related decrease in the nuclear materials required for the warheads of those weapons. And that same principle will apply to a lesser degree to our other types of weapons systems. So that the important point to emphasize, I think, here now is that the rate of increase in our nuclear warhead stockpile will be lower in the future than it has been in the past, and this will be translated into a reduction in the production of the type that we have referred to with respect to Fiscal '65.

Q I have a question for Dr. Seaborg. You stated--

SECRETARY RUSK: Perhaps we might let him comment first on this budget problem.

DR. SEABORG: I wonder if I might not comment first on this budget problem--

Q Yes.

DR. SEABORG: Of the savings in connection with this reduction in the power, and the shutting down of the four reactors will be about $50 million in Fiscal '65.

This of course will be reflected in slightly larger amounts in subsequent years, because it will be necessary during 1965 to come down to this operating level, and then, once reached, the savings will be greater in subsequent years, and we estimate something like $70 million in Fiscal '66 if there are no further reductions. The savings--the $50 million is divided about $37 million between the gaseous diffusion plants and $13 million between the plutonium--for the plutonium-producing reactors.

When the saving goes up to $70 million in Fiscal '66, the diffusion will be about $44 million to the gaseous diffusion plants and $26 million in reactor savings.

There will also be built-in savings from the standpoint of acquiring raw materials. We have commitments amounting to about one billion dollars contractual obligations for acquiring raw materials amounting to a total of about one billion dollars between now and roughly 1970. The rate of acquiring these is decreasing at approximately an amount of about $50 million a year for the next several years, so that then there will then

each year be about a $50 million savings in that area as well.

SECRETARY RUSK: Any attempt to project budget comments in the defense field over a long period of time, of course, is always subject to the development of the entire world situation. We still have some very dangerous questions on our docket, and although there has been some indication that our defense budget will turn down slightly this year, it still remains a very formidable defense establishment.

Q Have you any reason to believe, Mr. Secretary, that the Russians will come through with a parallel reduction in their fissionable material?

SECRETARY RUSK: Well, there has been no discussion with them on that. This has been simply a question for them to take up now in the light of what we are doing.

Yes. A question here?

Q My question has to do with the percentage of plutonium production that this cutback represents. Dr. Seaborg, you state that the three oldest and smallest reactors at Hanford will be shut down and the oldest

reactor at Savannah River, so rather than how many reactors are being shut down, what proportion of our production is being curtailed?

DR. SEABORG: Well, I don't know whether I would be prepared to give that with any accuracy at all.

SECRETARY RUSK: The State of the Union--

DR. SEABORG: No. That is twenty-five per cent of the uranium.

SECRETARY RUSK: Of uranium.

DR. SEABORG: There are 13 reactors in all, 9 at Hanford, when the NPR starts up, and 5 at Savannah River. They are not all of equal capacity, and I believe that the exact capacity is classified. Therefore, it is of the order of four parts in thirteen, but that isn't exactly right. It would be more like four parts in fourteen, or fifteen, because some of the reactors are larger.

ECM

Q And one other question in clarification, if I may. The President said that we are cutting back our production of enriched uranium by 25%. Dr. Seaborg's statement says that the combined electric energy usage is being curtailed by 25%. Are you both talking about the same thing? In other words, is the amount of electricity consumed directly proportional to the amount of enriched uranium produced?

DR. SEABORG: Only roughly proportional. The amount of production also depends on the degree of enrichment, the degree to which you run your tails, and so forth. So it is only a very rough proportion, I think.

Q Secretary Rusk, we have in the past discussed, or proposed to the Russians, a 30% cut on fissionable materials. I think at one time we even talked of going to 50%. Could we get an idea of whether this now unilateral cut is, roughly, comparable, smaller, or greater; and, also, why the diplomatic situation has changed that we can now do this without agreement with the Russians?

SECRETARY RUSK: Well, I think the point there is that our Phase I proposals under the Geneva Disarmament Plan stand, of course. And these would have to be taken up in connection with those proposals if it became a matter for international discussion to move ahead on those discussions. Those, as you know, are stalled at the present time.

But I think the fundamental explanation of this cut is really on the basis of need, and whether weapons and stockpiles in excess of need are desirable to be carried in our establishment.

Q Could we get an idea whether this cut is roughly comparable to what we had proposed for the disarmament?

SECRETARY RUSK: I think the 30% across-the-board that we had prepared in the disarmament field would go far beyond anything of this sort--far beyond.

Q Dr. Seaborg, in connection with your cutting down four, and starting up one, in general terms of percentages, where does that leave you? Is the NPR, which is your most modern

one, large enough to generally offset the shutdown of the four oldest ones?

DR. SEABORG: No, it isn't. There will be a net reduction in plutonium capacity.

Q Secretary McNamara, the ICBM was a major weapons advance, and you stated that much of defense spending over the past three years has been in the nature of capital investment in these weapons, and that this should, therefore, taper off once they are acquired. Does this imply that we don't see any need for any other major breakthrough of a weapon after ICBMs? Can we be assured that any other major development of this sort will not be necessary?

SECRETARY McNAMARA: No, I think not. Certainly, there will be new weapons systems introduced in the future. But it is unlikely that any of them will require as large a capital investment in as short a period of time as did the ICBMs. And certainly that is true in relation to the nuclear materials requirements for such systems. The ICBMs required a hugh increase in both numbers of warheads and in the nuclear materials for those warheads. Of course, associated with the

introduction of the ICBMs has been a reduction in our bomber force, particularly the B-47 bombers, which as you know are gradually being phased out of the force. The warheads of those bombers, of course, contain nuclear materials which can be reworked for other weapons systems. Nuclear materials differ in that sense from the materials of other munitions. They are not consumed in training. They don't wear out, with the possible exception of a very slow rate of decay of certain types of them. There is no loss through obsolescence.

Therefore, when a weapon system utilizing nuclear warheads becomes obsolete and is replaced by new weapons systems, the nuclear materials contained in the warheads of the obsolete system can be reworked to provide warheads for the new system. In this sense, nuclear materials, as I say, are quite different from other munitions, and this is one of the factors affecting the requirement for production in the future, and one of the factors that contributes to our ability to cut back production in fiscal year '65.

Q Secretary Rusk, please?

SECRETARY RUSK: All right.

Q Mr. Secretary, I understood the President to say this morning that the Defense Department was going to get $49.2 billion in fiscal 1965. I believe that is about $3 billion less than you are getting in fiscal '64, is it not?

SECRETARY McNAMARA: I didn't hear the President speak of the Defense Department budget this morning. It hasn't yet been made public; it won't be so for several days.

Q Well, you know, he said that they had asked $59.3 billion, and they got $49.2 billion.

SECRETARY McNAMARA: I didn't hear him say that either.

Q That was in the discussion with the reporters at the White House. It was not on the record.

SECRETARY McNAMARA: In any case, the final figures for the Defense Department budget won't be made public for several days, and I don't think we should discuss it now.

Q Mr. McNamara, they are on that sheet. That is a briefing from the White House.

SECRETARY McNAMARA: That may be, but the figures you are discussing are not the total story of the Defense Department's budget, and it is not appropriate to discuss it here this afternoon.

Q Mr. McNamara, the President referred to closing of Defense installations, obsolete installations. Are you contemplating additional installations other than the 33 you have already mentioned in the coming year?

SECRETARY RUSK: Would you repeat your question, please?

Q Yes. The President referred to the closing of obsolete defense installations. Are these in addition to the 33 you have already mentioned in the coming year?

SECRETARY McNAMARA: We have made firm decisions only with respect to the 33 which had been announced. There are some 6,000-plus defense installations. We have some very large and complex studies under way of several of the major systems, one of which is the shipyards system, for example.

As these studies are completed during the year, I would anticipate there will be further modifications of our base structure. Some of them are so complex it's going to be many months before they are completed. Others will be completed in a lesser time. I don't want to predict the results, other than to say I think that you should expect a gradual reduction in certain portions of the defense installations system, particularly those relating to weapons systems which are being phased out of the inventory and the most notable of those, of course, is the entire B-47 bomber system.

Q Mr. Secretary, have you anticipated the effect of these reductions overseas, particularly among

our dependent allies as being possibly a weakening of American commitments to them?

SECRETARY McNAMARA: The question is, will these ships in bases and installations, particularly will these ships in weapons systems, be interpreted by our allies as a weakening of our support to them. I think not, because, using the B-47 as an illustration, our allies are quite familiar with the fact that the B-49, which is an obsolete heavy bomber system, is being replaced with modern Minutemen with a much faster reaction time, a much greater assurance of penetrating the defensive systems and therefore a much greater capability.

SECRETARY RUSK: Also, Mr. Davis, may I just add the comment that in this field we are dealing with ranges of power of almost unimaginable scale, I think there is no doubt in our--

Q Would you say that again, sir, ranges of what?

SECRETARY RUSK: I say dealing with ranges of power of almost unimaginable scale. And our allies fully understand the enormous power of this country in

its defenses, under our new budget as well as under our old budget.

Q Mr. Secretary, I'd like to refer to Max Frankel's question, if I may, in order to understand the significance of what we are doing unilaterally in relation to previous disarmament proposals that we have made. You said the 30 percent reduction that we proposed to the Russians, which they have not accepted, would go far beyond what we are doing ourselves now. In order to help us understand this and without violating security, could you give us a guesstimate or an estimate of some kind as to how far along this road we are traveling now? Is it 10 percent?

SECRETARY RUSK: No. I'm talking about the 30 percent across the board, was literally across the board--conventional weapons, delivery vehicles and all the rest of it, you see. So that this Phase I proposal that we have made is much more far-reaching and involves problems of assurance, inspection, verification, things of that sort, that are not involved here in this reduction which is possible because of the situation of need and excess of need.

Q But after you get all through weighing that, what reduction does it amount to in our over-all force that we could use as a bargaining point?

SECRETARY RUSK: I think if you took up the question of 30 percent of the--this is only a small fraction of what would be proposed in Phase I in Geneva and on which we have made no--this is reduction in production.

Q Is that proposal now in effect overtaken--

SECRETARY RUSK: You see, these proposals in Geneva are reductions in inventory and delivery systems, and all the rest of it, you see.

Q No, but we did make a proposal, Mr. Secretary, on fissionable materials. Is that now overtaken by this action?

SECRETARY RUSK: No. I think that we have had standing a proposal on committing certain fissionable materials to peaceful purposes on a balanced basis between the two sides, and this does not cancel that.

Q Mr. Secretary--

MR. MANNING: I might add, I could clarify that, for those of you who are interested in following that up, right

afterwards. It's technical, and I have the material here. I don't think we need to go into it now.

Q Mr. Secretary, I'd like to get back to the same thing this way through Dr. Seaborg perhaps. Could you you clarify for us, Dr. Seaborg, if these cutbacks discussed here are the same cutbacks that youwere talking about generally in your testimony during the test ban hearings and which have been long contemplated, back as far as the Eisenhower Administration?

DR. SEABORG: I don't know about the latter part of your question. But they are--in July of 1963, the Atomic Energy Commission made the statement that in view of the fact that our production capacity was so large, we would make an assessment as to whether we are producing more than we need. And it is connected with that study, yes, sir.

Q Had these cuts been approved by President Kennedy? In other words, this isn't something that just came up during this latest reappraisal of the budget?

SECRETARY RUSK: No. It did not come up until the budget discussions brought it to a decision.

Q Mr. Secretary--

SECRETARY RUSK: I will take about one more question.

Q Does this amount to an admission that there is something to the overkill criticism?

SECRETARY McNAMARA: Let me answer that very briefly. No.

[Laughter]

And the reason is this: the overkill theory says that we have too much. By overkill they simply mean we have anywhere from one--depending upon whom you are talking to--ten or a hundred times more in inventory today than we require. What we are stating by the production cutback is not that we have more in inventory. We don't have a single weapon of overkill capacity today. What we are saying is that the rate of increase in our stockpile or our inventory will be less in the future than it has been in the recent past and therefore the rate of production can be cut back from current levels.

SECRETARY RUSK: Thank you very much, gentlemen. We have to go.

[Whereupon, at 3:30 p.m. the briefing was closed]

U. S. ATOMIC ENERGY COMMISSION
San Francisco Operations Office
211 Bancroft Way
Berkeley, California

NEWS CONFERENCE - APRIL 2, 1964

(The following is a transcript of the news conference conducted at the site of the Stanford Linear Accelerator Center under construction for the AEC by Stanford University.)

Conducting the conference were:

Dr. Glenn T. Seaborg, Chairman, U. S. Atomic Energy Commission
Frederick Terman, Stanford University Provost and Vice-President
Dr. Wolfgang K. H. Panofsky, Director, Stanford Linear Accelerator Center
R. W. Joyce, Vice-President-Commercial Operations, Pacific Gas and Electric Company.

Also present were David Packard, Chairman of the Stanford Board of Trustees committee on SLAC; E. R. Stallings, County Manager, San Mateo County; Mayor Donald J. Graham, Woodside; and representatives of the news media.

Dr. Seaborg: I thought I would begin with a little explanation as to why I am here. I had scheduled a trip to the Bay Area a number of months ago, and I had scheduled it with a number of business items to take care of. As things have developed down here at Woodside I decided to cancel all of these appointments for this morning and take a first hand look at the situation. And to meet my many admirers in Woodside. And perhaps give them an opportunity to see that a member of the AEC is not the ogre that some seem to think he might be.

We have made a tour of the area with the transmission line up in the hills and with the transmission line down to where the Stanford Linear Accelerator would hook in. Accompanying me on this tour were Mayor Graham of Woodside; Mr. Stallings, the manager of San Mateo County; Mr. Joyce, Vice-President of the Pacific Gas & Electric Company; Dr. Panofsky, Director of Stanford Linear Accelerator project; Mr. Packard of the Stanford Board of Trustees; and Mr. Ellison Shute, Manager of the San Francisco Operations Office.

We have had a very friendly, I think, discussion. We have a mutual problem here that we are trying to solve in good faith. I might add that the members of the AEC and the other members of the federal government who are involved in trying to solve

this problem are in my view hard working public officials trying to do their duty in the manner that they see is right.

There are a number of problems here that occur to the impartial observer in trying to look at the possibility of placing this line underground in view of the high cost involved.

One is that the Federal Government adheres to good local practice in situations of this sort. And here we are faced with the situation where there already are hundreds of poles, something like over 500 power poles in the City of Woodside and thousands of power poles in the County of San Mateo, whereas if I counted correctly on the map, there are 14 poles at issue, 5 of them in the City of Woodside. Now to begin by trying to put this high voltage line underground at a cost of millions of dollars seems from the point of view of those who have responsibility for this as being the wrong way to start. You can put power lines underground for 1/10th or 1/20th of the cost at low voltage, and, so far as the observer is concerned, you can't tell the difference between a high voltage and a low voltage line.

Another aspect of this that I think should be brought to your attention is that as a practical matter this is not something for the AEC to determine. The legislative history of the project is such, and in view of the hearing that was held on January 29 before the Joint Committee on Atomic Energy where representatives of San Mateo County and Woodside were present, that an authorization from the Congress would be necessary as a practical matter in order to spend this much federal money for a project of this kind.

Now, the Commission has tried to approach this from the beginning in a spirit of compromise. We have been working on the problem since last summer, something like 8 months, and in recent weeks I would say that this probably has been a matter on which we have spent more of our time than on any other matter. I think this is a fair statement. We have said that we would accept something far less adequate than PG & E would furnish if they put the power in on overhead towers; that would be dual circuits of 300 megawatts each. In a spirit of compromise to try to find something that would be much better looking the AEC has said they would be willing to accept a single circuit, 300 megawatts, on tubular poles which at least to us don't seem to be unsightly. We have also said that we would go further than this and accept an even less adequate system of power conveyance, namely underground, where we would have only a single circuit, only 180 megawatts of power, provided a method of financing it could be evolved that would not involve the Federal government paying the <u>entire</u> cost.

I think that I would like to close these brief opening remarks by saying that the community here has in the Stanford Linear Accelerator a tremendous scientific development. It is one that almost any other part of the country would welcome I believe, even with overhead power lines, if I may be very frank about it.

High energy physics is one of the leading intellectual developments of our age. It is not only very exciting but it will probably, experimentation in high energy physics will probably, lead to some of the most important theoretical and, perhaps following the theoretical, the most practical developments of our age. It is distinctly in our national interest to carry on research in this field, and all parts of the country, many parts of the country, are vying for the privilege of carrying on research in this field. And I think the entire community should be happy that such an important aspect of science is being carried on in your community, in your neighborhood.

And I think with that perhaps I have said more than I should have, and I will be ready to try to respond to any questions anyone might have.

QUESTION: Is the Commission flexible at all, Dr. Seaborg, on its decision to go underground only if there are other groups sharing the cost of the underground cables? Or is it a firm decision?

DR. SEABORG: As a practical matter the Commission wouldn't be able to bear the entire cost for going underground without legislative authorization, in view of the history, the legislative history of the project. So in that sense I suppose I would say they are not flexible.

But don't misunderstand, I am saying, as I have said in all of the letters I have written to Mayor Graham and Mr. Stallings and others, that if any reasonable arrangement of cost sharing could be put forward, the Commission and the Federal government and the Joint Committee on Atomic Energy are ready to consider it. And the representatives of the Joint Committee, particularly Mr. Holifield and Mr. Hosmer told Mayor Graham and Mr. Stallings this at the January 29 hearing before the Joint Committee on Atomic Energy.

QUESTION: You mentioned that the Federal government adheres to good local practice. And in the 1954 act which created the Atomic Energy Commission there is a section which says that the AEC in transmission of power should not contravene local ordinances. Or something to that effect. I just wonder if you can explain how the AEC has the authority to move on this condemnation?

DR. SEABORG: Well, it is the opinion of the AEC General Counsel that if it should unfortunately become necessary to move through eminent domain, the 1954 act as amended and the legislative history of the project does give the AEC through the Department of Justice this right.

QUESTION: Has this particular point been amended?

DR. SEABORG: No. I think that this particular point as you have described it doesn't forbid that or take away that authority as I understand it, as the result of the study of it by our General Counsel, the General Counsel of the Atomic Energy Commission.

QUESTION: In the friendly discussion with the group in the car this morning did you get any indication that something could be worked out at this point?

DR. SEABORG: We did discuss the advantages of the freeway route and it seemed to me that this has some advantages that might be explored further. Other than that, I don't know that we came up with anything concrete. You understand, of course, that we spent about an hour rather busily looking over the entire area.

QUESTION: You didn't hear anybody offer any more money than you have heard up to now?

DR. SEABORG: No, sir. I didn't hear anybody offer any more money this morning.

QUESTION: What do you mean by exploring the freeway further? How does that fit in?

DR. SEABORG: Well, we didn't discuss it in the detail of any plan of how you might do this.

QUESTION: This would be underground routing?

DR. SEABORG: No, no. Overhead poles on the freeway as being preferable, the tubular poles as preferable to the other route. I don't know. I haven't made that detailed a study of it but that was discussed. Somebody asked me if there were any possible solutions discussed and that was really the only one that was discussed during our automobile ride this morning.

QUESTION: Do you mean along the freeway instead of over the countryside?

DR. SEABORG: Along the freeway, through Woodside, yes, rather than over the countryside. This would take more than 5 poles I believe. That would take 6 or 7 poles, I believe.

QUESTION: In cost comparison what would be the difference between overhead and underground?

DR. SEABORG: The overhead on the towers cost is about $668,000. The overhead on the tubular poles as I understand would be about $922,000 but augmented up to about $1,012,000 in order to give the complete installation. The cost underground for the dual circuits of 300 megawatts each is of the order of $6 million or something of that order - $6,400,000. The underground for a single circuit of 300 megawatts, of course, which is less adequate for the project, is of the order of $3,600,000. Cost for the underground for a single circuit 180 megawatts line which is much less adequate, but which the AEC in a spirit of compromise is willing to accept, would be about $2,600,000.

QUESTION: Aside from meeting these people face to face - Mayor Graham of Woodside and Mr. Stallings of San Mateo County - what do you think was accomplished by your visit?

DR. SEABORG: I got a first hand view of the situation that I can convey back to my colleagues on the Atomic Energy Commission and to the other members of the Federal government and the Congress who are interested in this problem.

QUESTION: Dr. Seaborg, did anything happen today that would make you think that the AEC's position as stated so far should be modified?

DR. SEABORG: Well, the AEC's position as stated so far has been quite flexible. We are still holding open the possibility of an underground line under a cost sharing plan.

QUESTION: On the same basis as you have already proposed though?

DR. SEABORG: We would be willing to look at any proposal. We haven't had any proposal. Frankly, we haven't had any change from the initial Woodside and San Mateo County position presented to us during the whole course of the negotiations and it is my opinion that the only

way that this can be settled will be with some kind of a compromise on both sides, and I don't feel that we have had any compromise offered on the other side yet, or if we have, I would be glad to have it called to my attention.

QUESTION: Dr. Panofsky has said that he would prefer to have the line put underground. Would you consider that he is on the side of Woodside?

DR. SEABORG: I would like for Dr. Panofsky, who is sitting by my side, to speak for himself.

DR. PANOFSKY: I have expressed the preference for underground simply because of the fact that I believe, as I believe everybody around here does, that it is the direction in which things will be going slowly all over the country. At the same time I have also expressed in all candor that I felt that the particular case made for undergrounding of this particular line is a relatively poor one. The reason is associated with the numbers which were being discussed here; namely that for a given amount of money you can put ten to twenty times more lines underground of equal physical size at low voltage than at high voltage. For example, if you will take the $150,000 which I believe Woodside is willing to contribute to the underground of the high voltage line and apply that to the 12 to 60 KV lines which are now prevailing around here on poles of the same height as the poles we are talking about, you could get something like 5 miles undergrounding while for the $150,000 you only underground 1/10th of the line we are talking about, or something like 1/3 of a mile of the high voltage line. My own personal view on the matter is that the general way to go is by a two-pronged approach, namely for the communities to push very hard to get all the lower voltage line underground as we have done here on the site. Once construction is finished SLAC will have no overhead facilities of any kind, with the exception of the primary high voltage line. And at the same time, we should try very hard to reduce the cost of these very high voltage lines because at this time the high voltage case is not a very good one, even if I would prefer to see them all underground.

QUESTION: The AEC has said that the cost of overheading would amount to something over $800,000 which would include construction and the condemnation costs. The opponents claim that the condemnation costs would be considerably

higher. And it might raise the total well over a million dollars. In any event the AEC has said it would cost over $800,000. Now, one of the proposals was to bring the line to the Stanford campus and let Stanford take it the rest of the way, either above ground or underground as they wanted to. Now this would cost about $2 million to bring the line to the Stanford campus. PG & E has offered to put up $1 million for the cost of an overhead line which would be half of this. If the AEC would put up just a little over the $800,000 it has promised, it would bring the line underground to the Stanford campus, and would, in fact, eliminate most of the controversy. Doesn't this seem to you something of a reasonable compromise?

ANSWER: No. There is a little mistake in your arithmetic. This does keep cropping up and maybe I should make an attempt to explain that. You have counted the $800,000 twice. The AEC was never going to pay the $800,000 for the cost of the overhead line two times. In the $1 million as I understand it, I don't know whether it is $800,000 - I thought it was $668,000 or something of that sort - is essentially recoverable to the PG & E Company from the Atomic Energy Commission in the rate structure, and shouldn't be counted twice.

QUESTION: This was considered in that $1 million from PG & E?

ANSWER: Yes, sir. That was considered in the $1,012,000 of the PG & E money. So that is the response to that part of your question where it concerns your arithmetic. It is somewhat erroneous.

Now with respect to Stanford University's reaction to having the lines underground up to their campus and then overhead, I would rather frankly refer to the representatives of Stanford University who are here - either Mr. Packard, or Dr. Panofsky, or Vice-President Terman.

TERMAN: This has never been formally presented to the Trustees. This alternative, that is. There has been discussion between a few of the Trustees between Board meetings. The Trustees originally had the position that they would like to see the power lines underground on Stanford land if possible. It became clear in time that this was going to be so expensive as to probably be unfeasible. If it was going to be overhead other places, Stanford would not insist that they ought to be underground on Stanford land.

So in the first place we didn't ask for special treatment, but I think by the same token that without predicting what the Trustees would do, I think they would object very strongly to a reverse discrimination policy which says that the lines will be underground outside Stanford land at Government expense, but Stanford would not be accorded the same treatment on Stanford land. Particularly as we have worked out the business of putting lower voltage lines underground which adjacent communities have not done.

QUESTION: In either case isn't it true that Stanford is not willing to put up any money either for the first proposal or the second proposal?

TERMAN: This is true. Money that Stanford has been given is being held in trust for educational purposes. The amount of money that other people have offered to put in, that is not going to be reimbursed by the government, is a relatively small fraction of the total cost of doing this operation. We are talking in the order of $1-1/2 to $2 million cost; the total amount that has been offered, less tax money, is not very large in comparison with that total.

QUESTION: I would like to know how long you are going to wait for something to be worked out here before you go ahead and come through with your condemnation?

DR. SEABORG: I believe that the Department of Justice - didn't they file last week? Yes. The proceedings are under way. But there is time, if a proposal comes in, for another arrangement. We will consider a proposal right up to the moment it won't delay the project. And I should say, and by the way I should have said this earlier, because this is an important point - we have waited so long now that we have reached the point where we are jeopardizing our ability, Stanford's ability, Dr. Panofsky's ability, to start up this accelerator when it is completed. When the construction has been physically finished that is.

QUESTION: I should like for you to clarify something. Are you saying that the AEC has jurisdiction over the City of Woodside in connection with the power lines?

DR. SEABORG: No, sir. No jurisdiction over the City of Woodside.

QUESTION: Can they go ahead with construction if no compromise proposal is reached?

DR. SEABORG: If the AEC exercises through the Justice Department the right of eminent domain, yes, sir, I suppose they can.

QUESTION: How would you like to see this resolved? Would you like to see the tubular poles go in? Would you like to see the lines underground? Or do you care as long as it is resolved?

DR. SEABORG: I want to make it clear that I have an appreciation for the aesthetics of the situation. I really do. I think I made it clear that AEC is willing to put up quite a bit of money, but that as a practical matter to pay for it all is not within our power to do. I think I made that point earlier.

I am interested in the aesthetics of the situation. I am a resident, on leave of absence, of Lafayette, a little town across the Bay that I think is just as attractive a community as Woodside. We, by the way, also have our overhead poles. I visited my home in Lafayette last night. I think that as a logical matter the best solution at this time would be the 8 tubular poles in the county and the 5 tubular poles in the city. These poles could be put up with as much attention to aesthetics as possible, painted green in order to meld into the country-side, with the minimum cutting of the trees and the undergrowth, which I also understand is possible. This would be the most logical solution.

But, as I said, we will continue to consider the other solution despite its technical disadvantages to the project, the underground one.

QUESTION: What would be your reaction if this $1,600,000 difference in overhead and the cheapest underground - if PG & E and the local interests and the AEC split the difference, say $1/2 million each?

DR. SEABORG: Oh, we would give that serious consideration.

QUESTION: You would consider that?

DR. SEABORG: Yes, sir. I can't commit my colleagues on the Atomic Energy Commission. We are, I can't say a five-man commission, but a five-member commission. We had a very nice lady join us on the AEC last week. All such matters are determined by the Commission as a whole, in so far as the Commission is concerned. It would also have to be considered by the Joint Committee on Atomic Energy and by the Bureau of the Budget and by the Administrative branch of the government, the Executive branch.

Thank you very much. I hope I have succeeded in being of some help.

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Press Conference
Held by
Chairman Glenn T. Seaborg, USAEC
Intercontinental Hotel, Gloriette Room
Vienna, September 14, 1964, 11 a.m.

Mr. Sorkin,
USIS Information Officer: I would like to thank you all for coming this morning. I apologize that you are crowded a little. This was the only room available at this time of the day. We are very pleased to have Dr. Seaborg here, I think for the fourth successive year. This press conference has become something of a Viennese tradition that we all look forward to.

I would request only that when you ask a question, give your name and organization so that the transcript can be complete.

Dr. Seaborg.

Chairman Seaborg: Thank you, Mr. Sorkin.

I would like to begin by introducing my colleagues at the table here with me; on my left is Ambassador Smyth, United States Ambassador to the International Atomic Energy Agency here in Vienna, and, on my right, is Commissioner of the United States Atomic Energy Commission James Ramey. And, also on my right is Mr. Durham, who is a former member of the United States Congress--Congressman--and most importantly a former Chairman of the Joint Committee on Atomic Energy of the United States Congress.

As Mr. Sorkin has said, this is my fourth meeting with the press and I notice a number of old friends among those present--some who have been with us, I guess, most of those four times, or maybe all of them.

We have come, most of us, from a meeting, the Third Conference on the Peaceful Uses of Atomic Energy in Geneva,

and at that Conference I had the privilege of giving the summary lecture--the lecture that summed up the Conference. I don't have copies of that lecture with me in sufficient quantity to hand it out in case some of you are interested, but I would imagine, Mr. Sorkin, that the United States Information Service office could probably make these available. I also had the pleasure of speaking to the European FORATOM group in Brussels last Thursday on the topic "Today and Tomorrow in Nuclear Power," which is really an elucidation of the United States policy for furnishing nuclear fuels, with emphasis on the recent legislation in the United States that permits private ownership of nuclear fuels, and I believe that for those of you who would like a copy of that, Mr. Sorkin could probably make that available, too, through the United States Information Service. I think that that is perhaps as much as I would like to start with in the way of a statement, and now I and my colleagues are ready to try to answer whatever questions you might wish to put to us.

Q Miss Branson, UPI: It is a rather obvious question, but could you perhaps sum up what you think the achievements of the Geneva Conference were.

A Chairman Seaborg: Well, this is Commissioner Gerald Tape of the United States Atomic Energy Commission coming in now.

A ~~Commissioner Tape~~ Chairman Seaborg: I think, of course, the achievements were basically to exchange information on nuclear power, but I think that the Conference showed that very definitely nuclear power has come of age, and that it is on the verge of being economically competitive with power from conventional sources of fuel in many parts of the world and, of course, we emphasize that this is true for certain parts of the United States. The predictions at the Conference were that nuclear power as a means of generating electricity will become more and more prevalent. In my summing up speech, I pointed out that we have--whereas there were only 5 megawatts or so of nuclear power at the time of the first Geneva Conference in 1955 and somewhat over 100 megawatts at the time of the second Geneva Conference in 1958, there are something like 5,000 megawatts of electricity generated from nuclear power throughout the world today, and I believe I predicted something like 25,000 megawatts by 1970 and something between 150,000 and 250,000 megawatts

that would be generated by nuclear power by 1960 (correction from the group, "1980")--by 1980. The megawatt being, of course, a million watts or a thousand kilowatts, so I could just as well have said today there are 5 million kilowatts and predicted for 1970 25 million kilowatts and for 1980 150 to 250 million kilowatts, and then the general consensus was that by the end of the century perhaps about half of the electrical power in the world would be generated by the nuclear source.

Q Mr. Jerome D. Luntz, Editor and Publisher of "Nucleonics": Mr. Chairman: Related to your question ...

A Mr. Sorkin: Please, will you identify yourself.

Q Mr. Luntz: Yes. Luntz of "Nucleonics."

Do you believe that there should be a fourth Geneva Conference and, if so, how often would you visualize that it should take place?

A Chairman Seaborg: Well, I don't know that I'd say that there should be one but I wouldn't go so far as a number of delegates to the Conference did in predicting that there wouldn't be one. I could easily visualize a fourth Geneva Conference, perhaps held in a more specialized area even than the Third--which in turn was held in a more specialized--groups of areas--covered a more specialized group of topics than the Second and the First. I wouldn't want to venture a guess--there were six years between the Second and the Third Conferences. I really wouldn't want to venture a guess on how long before there is another Conference, but it wouldn't surprise me at all if there would be another Conference. I think it would be rather--I think it would be foolish to predict that there is not going to be another Conference.

Q Mr. Benedict, AP: Mr. Chairman: Now that the Geneva Conference has more or less stolen the show from the Vienna Conference, what is left for the Vienna Conference to do?

A Chairman Seaborg: I don't know that they are competitive. The Vienna Conference, of course, is an annual affair. The very success of the Geneva Conference and of nuclear power means that the International Atomic Energy Agency is destined to play an even more important role, and the coming of age, as I have called it, of nuclear power really means also

the coming of age of the International Atomic Energy Agency. The International Atomic Energy Agency is beginning to play an important role in safeguards and just as nuclear power in general has in a sense come of age in the last year or so, the importance of the role that the IAEA plays in the nuclear power, in many ways, including handling the safeguards problem, has come to the forefront in the last year. So I might almost say that the IAEA has come of age, along with nuclear power in the last year or so. So I don't know that I would agree--perhaps from the standpoint of the press coverage it might have stolen the show--but the very success of the Geneva Conference and the coming of age of nuclear power bodes ~~holds~~ well for the International Atomic Energy Agency.

Q Dr. Mysels, "Wochenpresse": How far have plans for the desalinization of sea water by atomic energy matured?

A Chairman Seaborg: Now, I am very happy to be able to call on one of my colleagues to help respond to that question. Commissioner Ramey is the Commissioner who has given special attention, policy-wise and operating-wise, to the desalinization question, using nuclear power. I would like to call on Jim to respond.

A Commissioner Ramey: Following along the Chairman's statement on the role of the IAEA, the IAEA has a special panel on the use of nuclear energy for the desalting of sea water and we used the occasion of the Geneva meetings there, with the technical people present, to have a meeting of this panel on the eighth of September at Geneva in which about 20 countries were represented and reported on the status of their interest in the use of nuclear energy for desalting and what their plans were. Several countries have expressed specific interest in going ahead on desalting of sea water; Israel, for example--there is a joint US-Israel team which is investigating the water and power requirements of Israel to see whether or not a plant or plants could be used and they have rather optimistic plans on going ahead. They figure by 1970, for example, they will need 200,000 electrical kilowatts of power--from 100 to 200--and in the water field, they would need from 80 to 160 million gallons of water a day. Well, in that range you could build a combined nuclear desalting plant that would produce water at a cost that might be competitive for domestic purposes and industrial purposes. It might

have a hard time competing for agricultural purposes. Although certain specialized crops might have some use.

At the meeting also the UAR indicated that it was out for proposals for a combined nuclear desalting plant in the size, as I recall, the electrical requirements would be in the range of 150,000 electrical kilowatts and perhaps 5 million gallons of water a day. This would be on the Mediterranean coast, near Alexandria.

The USSR indicated that they are building a reactor in the Caspian area; that they would hope to hook up at a later stage a desalting plant; that it would probably be fossil-fired at the start, using conventional fuel and then later take the steam from the reactor.

The United States has underway a study with the Metropolitan Water District of Southern California, a study jointly participated in by the Department of the Interior and the AEC, with this Metropolitan Water District. The Water District is an organization that owns the aqueduct from the Colorado River to the Southern California area and this is a detailed engineering study looking to the building of a plant of a minimum of 50 million gallons of water a day and anywhere from 150,000 electrical kilowatts to 750,000 electric kilowatts. We expect to have that interim report on that by the first of the year and hopefully would have a plant in being by 1970.

So you can see that there are a number of concrete plans that the other countries are exploring what their power and water requirements are.

What I have explained to you here: You have to have a fairly good-sized electrical requirement and water requirement before a nuclear plant is economic; on the smaller size fossil-fuel plants will probably be more economic, and in the plants of, say, a million gallons and smaller, some of the new sources that don't use the distillation process would perhaps be more economic.

There is a new process called a "membrane" process--reverse osmosis--that has promise--that the desalting people in the Department of the Interior and other places are going through the

laboratory stages. We would expect to have further meetings of this IAEA panel, perhaps again next spring, and to bring up to date the programs that the various countries are undertaking.

In the United States we are in process of coming up with an accelerated program, a more aggressive program for the desalting of sea water by nuclear means, as a result of instructions by President Johnson which he issued in August, and we would hope by some time in early October to make an announcement on the nature and extent of this program. I submitted a statement to this IAEA panel that I believe could be made available here through our press people and there were also three papers given at the Geneva Conference: one by the Israeli representative, one by the Tunisian representative, and one by myself on behalf of the United States.

Incidentally, the Tunisians are also interested in the desalting by nuclear means and they have proposals out also--invitations for proposals, which, I believe, they have received. They are in process of analyzing them now to see whether a plant would be economic there.

A Chairman Seaborg: So, that there are economic advantages to dual-purpose plants--those that desalt water and generate electricity as well--with increasing advantage for nuclear as compared to conventional fuel for these plants as the size increases. The bigger they are, the more appropriate nuclear fuel seems to be.

With respect to the question on the possible relationship of the IAEA Conference and the Geneva Conference, their purposes and their method of conducting the conference are quite different and I would like to ask Ambassador Smyth, perhaps, to elaborate a little bit on that.

A Ambassador Smyth: Yes. I would be glad to.

The Geneva Conference, as has been said, was a conference for the exchange of scientific and technical information. It was held after a six-year interval after the previous one. In fact, the IAEA played a very important role in the organization of that Conference and did a good deal of the work. Mr. Ramey has mentioned that there was also an IAEA panel on desalting.

This is typical of the kind of panels and meetings that the IAEA sponsors every year for the exchange of scientific information. The General Conference, beginning this afternoon here, is for quite a different purpose. The General Conference is, so to spekk, the meeting of an assembly of the representatives of all the members of the IAEA to review the activities and business of the IAEA. It meets every year. It is concerned with things like the budget, election of members of the Board of Governors, and review of the program, but it is essentially an administrative organization so that the IAEA can conduct its business throughout the next year and hold the kind of scientific conferences--on a small scale, usually much smaller than Geneva, but the kind of conferences where scientific and technical information is exchanged, of which Geneva was a very enlarged example--and also to make plans for the various other activities of the IAEA. So they are simply not comparable at all in purpose or scope.

A Chairman Seaborg: This is the eighth annual Conference of the IAEA.

Q Mr. Sorkin: Question: Somebody raised his hand back there?

Q Mr. Baer, "Nucleonics": Mr. Chairman: About two weeks ago in Geneva, the statement was made--I believe it was by you--that about now a report will be issued on advanced converter concepts. It will be very interesting to hear which of the three concepts, or types, has been decided on.

A Chairman Seaborg: I said that there would be a report issued very early; ~~bub~~, in fact, I believe I said perhaps before the end of the Conference. It will not be issued until after we return to the United States. With the whole Commission in Europe this way, it is very difficult for us to actually transact final business, and we will get at that as soon as we get back to the United States.

Mr. Baer: Thank you.

Q Mr. Benedict, AP: Mr. Chairman: Re safeguards. What is the situation in the negotiations with Rumania? Have the Rumanians given assurance that they

would, if they obtain reactors from the United States, also accept Agency inspection of these reactors?

A Chairman Seaborg: I don't think that the negotiations have got far enough yet that we could...In fact, there have been just feelers with that implication but I don't think that negotiations have gone far enough that you could say one way or another.

Q Mr. Brook, "Statesman of India,"Calcutta: Are you prepared to say anything about the United States project "Plowshare," and has any other country or countries expressed an interest in it?

A Chairman Seaborg: Here, you mean, at this...?

Other countries have expressed an interest, yes.

Q Mr. Brook: That is why I asked you. There is a report here in the London newspaper yesterday saying that approaches have been made to the United States by the Soviet Union and Rumania.

A Chairman Seaborg: Yes. I wouldn't say approaches. I would say that representatives of those countries and many other countries in corridor conversation discussed with us the potential of "Plowshare" and mutual interests. The UAR; of course, Australia has had a continuing interest and a number of others in corridor conversation indicated an interest and a desire for more knowledge. Dr. Gerald Johnson gave a paper on this, and I would imagine that we could make a copy of that available to you. And this sort of served as a spark to ignite a great deal of interest. That is really the source of the interest.

Q Mr. Katscher, "Arbeiter-Zeitung": Please, Mr. Chairman, what are your predictions for fusion power and for nuclear plasma?

A Chairman Seaborg: That's an obvious one. I always like to pass the questions around and I was looking for one that was particularly appropriate for Commissioner Tape. As I did in another news conference, I would like to have Gerald respond to that.

A Commissioner Tape: This same question was asked at the news conference before Geneva. Just prior to the Geneva Conference. And at that time we stated that we had been most pleased with the technical

progress in the field of plasma physics, looking for the ultimate hopeful use of fusion power. The Conference had one session--that is, the Geneva Conference--on this same subject and my evaluation of that particular meeting, one session, was that representatives of the various countries reporting on their work in effect confirmed this same statement--that the technical and scientific progress within the past few years has been most gratifying. We do not have what I think you are hoping to hear, that is, an engineering-demonstration type of the fusion reaction in a practical sense. This is still quite a ways off and when one says, "What is your prediction," we have to say that because we haven't done it on that practical scale, how can we say when we are going to do it.

However, the advances in plasma physics, the understanding that has been gained, the fact that we all recognize this as a most difficult subject but that we are making strides in understanding what is going on scientifically and technically within plasmas, how to combine them, how to study their stabilities, and so on, plus the fact that if we can be successful in reaching that practical situation, we will have made such a tremendous step forward in terms of energy availability to the world, we are going forward with real vigor.

A Chairman Seaborg: In my summary of the Geneva Conference, running some 20 pages or so, I devoted about a page of carefully worded summary of this, which concludes as follows: /Read from document./

> "We cannot be absolutely sure that controlled thermonuclear power can be developed, althouth the general feeling at the Conference is that this will be accomplished at some time - perhaps before the end of the century. Certainly the benefit - essentially unlimited power for the earth's population for all time - is one we cannot overlook. Indeed, I agree with expressions of some of the delegates that the approximtely one hundred million dollars spent worldwide each year in the nuclear fusion field is too low an investment for research with such vast potential benefit."

Q Mr. Baer, "Nucleonics": Is there here any concrete hope for the realization of joint high energy particle

facilities? We had a meeting in Vienna recently that was not at all promising.

A Chairman Seaborg: And Commissioner Tape attended that meeting, so I think he is again the appropriate person to respond to that question.

A Commissioner Tape: You will recall that the meeting here in Vienna was an exploratory meeting, in which participants from USSR, Western Europe and the United States discussed together for a day and a half the prospects--first of all the needs--and then the prospects of international cooperation in the design and construction of very high energy accelerators. We focused our attention principally on accelerators of 300 GEV and higher--the situation which we found at that meeting was that although all of us were most interested in ways and means of obtaining higher energy machines, it seemed to be too early for all nations to become heavily involved at this point on a machine of that energy. My own personal evaluation is that the Russians, for example, with their 70 GEV machine now under construction and other machines soon coming into use in Russia, were more concerned with the problem of getting on with what they have rather than to become involved at this time in even larger undertakings.

We in the United States and the Western Europeans are considering strongly the machines in the energy range up to about 300 GEV and here we are undertaking discussions on a national basis [illegible]--if you think of Western Europe as a nation. [illegible] As you no doubt know, we agreed to keep in contact with each other. The Director General of the Agency was asked to continue explorations with the various countries and to set up further meetings. But at this last meeting--we did not look with a very great encouragement about going to the very high energy machine in the immediate future.

Q Mr. Baer, "Nucleonics": Commissioner Tape: Is there a possibility that the United States and certain countries would team up exclusive of the Russians?

A Commissioner Tape: We in the United States are looking into all possibilities of international cooperation. We have not agreed or we have not discussed in any detail the possibilities of teaming up together on something less than 300. It is our own belief that generally machines up to about 300 GEV can

be managed on a national scale but we do not preclude any discussions or investigation of cooperative machines.

Q Mr. Baer: What is the price range, about?

A Commissioner Tape: Two hundred GEV is between 250 and 300 million dollars for construction. I think you must appreciate that machines of this size will support a research program which annually is very expensive; that the cost of the machine, in the first instance, while large, is perhaps the smaller part of the decision to go forward with such a machine because in order to get out of them the research that they are capable of supporting is also going to cost substantial sums each year. This might be, for example, of the order 75 to 100 million dollars per year if one supported the machine fully. So, international cooperation looks very attractive on the continued operation of any machine no matter who builds it.

A Chairman Seaborg: ~~If~~ The cost of machine has to be duplicated every three or four years in its operation--and by operation we are talking about the total research program, not just operating programs.

Q Miss Branson, UPI: Can we come back to layman's language now?

Sir, we all know that the signing of the Partial Test Ban Treaty in Moscow was one of the milestones in US-Soviet relationships in the field of atomic energy. Would you say that there have been other milestones reached since that time?

A Chairman Seaborg: Well--

Q Miss Branson: Is there anything pending?

A Chairman Seaborg: Yes. It is difficult, though. You have set a standard. You said "comparable to that."

Q Miss Branson: No, let's say "since that time."

A Chairman Seaborg: Yes, there has been a real implementation of ~~for~~ the agreement for cooperation that Chairman Petrosyants and I signed in Moscow in May of last year. In the way of exchange of information, exchange of visits. The Soviet delegation with Chairman Petrosyants himself as the leader had a return visit to the United States in November and then there have been groups on ~~groups of~~

solid state and plasma physics exchanged, the American group going to the Soviet Union and vice versa; and there are other exchanges planned for later this year and early next year in specialized areas. Also, there has been an agreement for cooperation in the field of desalting of sea water and, particularly, nuclear desalting ~~and as a result of, not, I would say,~~ initiated after a correspondence at higher levels, by a visit of the Soviet delegation ~~by~~ *led by* Academician Churin to the United States in July and we look forward to continued cooperation in that field.

Q Mr. Katscher, "Arbeiter-Zeitung": Again. Perhaps it is too early to ask a question before the beginning of today's Conference, the General Conference.

Will there be any announcement to offer the United States Delegation except the ordinary business?

A Chairman Seaborg: Well, there will be an offer or two. Yes, there will be. Too early to say so.

A Commissioner Ramey: Too early to leak.

Q Mr. Luntz, "Nucleonics": A two-part question on safeguards: 1) Do you anticipate that the United States will add any additional units, nuclear power plants, to the safeguards control system under IAEA; and, beyond those that you now have 2) do you anticipate the USSR putting any plants under the safeguards system?

A Chairman Seaborg: Well, as far as the first part of the question is concerned, I would just say we will continue to watch that to see how it develops. We don't have any concrete plans at the present time, but as the situation has arisen we've added plants like the recent addition of the Yankee Power Reactor in New England to the safeguards situation.

With respect to the Soviet Union, I obviously don't know; I can only hope that that would happen some time in the future. We have succeeded, as you know, in transferring the safeguards aspects of our bilaterals with a number of countries to the Agency. Norway, Greece, the Philippines, Austria, Viet Nam, Portugal, Japan have all agreed to the transfer of the safeguards to the Agency in connection with the transfer of fissionable material to power reactors in those countries, in some cases, ~~when~~, they do not have

power reactors yet from the United States, and a number of countries have agreed to obtain their nuclear fuel from the Agency. Of course, these, I believe, are research reactors, their nuclear fuel as well as the safeguards coming through the Agency. And that includes Yugoslavia, Finland, Mexico, Pakistan, Congo. All and all, I think it is a very impressive move and most of it has taken place within the last year. And that is why I say the Agency has come of age in the last year along with nuclear power. The United States considers it important that these safeguards be transferred to the Agency now before there is a large nuclear power industry developed throughout the world when it would be more difficult to do so.

Q Patricia Clogh, "Reuters": In Geneva, Dr. Smyth said something about revising the safeguards. What revisions did he have in mind?

A Ambassador Smyth: Well, the Agency had a safeguards system that was instituted several years ago that was limited to small reactors, relatively small. Last February the Agency extended that system to cover reactors of all sizes so that it could cover power reactors. At the same time the Board of Governors authorized a review of the whole system in terms of clarification and re-study and that is now going on. There was a meeting about it in May and there will be another meeting at the end of October. We don't anticipate any basic change in principles, but clarification, and making sure that the system is suitable for large power reactors and that kind of thing.

A Chairman Seaborg: Maybe that, perhaps, covers it.

Thank you very much.

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

4/21/65

TO : Phil Jacques, Deputy Director
Division of Public Information, HQ

DATE: April 21, 1965

FROM : Rodney L. Southwick, Assistant to the
Manager for Public Information, SAN

SUBJECT: CHAIRMAN SEABORG'S NEWS CONFERENCE - APRIL 21, 1965, IN SAN FRANCISCO

PI:RLS

The following is a roughly paraphrased account of Chairman Seaborg's news conference of April 21, 1965, prior to his address to the Northern California Chemical Industry Council at the Mark Hopkins Hotel, San Francisco. (It might be noted this witness was located behind a few TV cameras and thereby establishes his alibi for inaccuracies.)

The Chairman opened the meeting by noting his visit in the morning to Sunnyvale where he said he had watched the bird flying the SNAP-10 reactor, the first reactor in space, which was launched from Vandenberg April 3. It operated perfectly and developed full design power. Systems relating to the reactor were working perfectly. It was 100 percent successful.

Q. Are we ahead of the Soviets?

A. Yes, definitely. This is a first for American space. We are ahead of the Soviet in this respect. This is part of the SNAP Program. There are two ways of developing power (1) compact nuclear reactors which produce electric power through thermoelectric effects and (2) decay of radioisotopes for electric power. We have a number in orbit. The Soviet has no comparable devices in orbit. I am confident we are ahead in the nuclear propulsion programs. ROVER is the development of propulsion for huge space vehicles over long distances with heavy payloads. We have had several tests at our Nevada Test Site. They are going very well. I am sure that the Soviet is making a huge effort in propulsion and auxiliary power, but we are substantially ahead at the present time.

Q. Did you see any Soviet nuclear propulsion work on your visits there?

A. No. But in 1964 at the Geneva conference the Soviet exhibit did reveal for the first time a compact fast neutron reactor called the Romashka. This apparently is a prototype for further development. It was not an operating reactor, but was a more ambitious type project. We also have work going in the fast reactor field.

Q. Recently some particles were released from an underground test. Is there anything further on this?

A. That was part of the Plowshare program and was a crater shot which resulted in a hole 350 feet by 100 feet. A small amount of radioactivity was released to the atmosphere which is impossible to avoid in cratering work. It was a very small amount and behaved about as such radiation would be expected to.

Q. Understand there has been some difficulty in designing elements for the seed-blanket reactor?

A. There generally are problems at this stage of development, and it is not surprising we have problems. There are very few projects where there are no problems. The seed-blanket reactor concept requires in one part of the core a burner seed, and the fuel elements must operate a long time--nine years--without reprocessing. Irradiation tests show that the present design configuration will not make the nine years. But even so they would last longer than any ever before. There will have to be a redesign. Admiral Rickover feels this will be possible to accomplish. The reactor as designed would produce useful power. But to get economic power, these particular fuel elements should operate the full nine years.

Q. Well, you don't even have a prototype or working model yet, but are up against time schedules, aren't you? If this is not solved, will it be necessary to go to other power sources?

A. The problem of not having a prototype is true of a number of cooperative projects. The AEC is no longer building reactors themselves. We use cooperative arrangements by furnishing some financing in development of new types--examples are the California reactor and the Public Service Company of Colorado reactor. These are prototype reactors. Their advantage is that the AEC and the Government get reactors built which are important to the future of the civilian nuclear power program. They are cheaper for the Government to build this way, and the cooperating partner gets power cheaper.

Q. Can the redesign (of the seed-blanket) be completed by spring or summer?

A. I don't know when. But the AEC is going ahead supporting the authorization. We are confident the difficulties will be overcome. This is not unusual in such developmental programs.

Q. Where do we stand on the feasibility of using Plowshare for digging a canal?

A. We are conducting a program of developing the technology of using nuclear explosives which includes (1) the development of the nuclear explosives themselves, particularly of clean explosives, which are required; and (2) developing excavation technology. An example was the Palanquin experiment last Wednesday to which you just referred. We believe it will be four to five years before we have the technology to tackle a job as big as digging a canal across the Isthmus. I feel the work leading up to that can be done within the treaty terms. But using nuclear explosives for the Canal excavation would require modification of the treaty some time in the future. You must remember there has been no decision yet on a new Canal, nor whether it would be done with nuclear explosives. The President has chosen a Canal Commission--Mr. Anderson as Chairman, Dr. Milton Eisenhower, Kenneth Fields and others, who will be responsible for a study of the matter and recommendations on where and how a Canal should be built.

Q. How do the Russians feel about Plowshare?

A. They are interested. At Geneva last year a number of top Soviet scientists engaged us in conversation on the prospects of using Plowshare for excavation, and also for uncovering the overburden from ore deposits. Emelyanov discussed the advantages of using nuclear explosives at molybdenum deposits. In the last year, the USSR has shown great interest in this program.

Q. Are we exploring such uses?

A. Yes. They are being studied. As this program develops we shall probably cooperate with mining companies. We have had interest expressed in such uses. In the years ahead we expect to do some experiments.

Q. How about conventional explosives; how do they compare?

A. For projects like a canal, indications are that conventional explosives would cost several times more than nuclear. Some routes, by nuclear methods, would cost less than a billion dollars, or even three-quarters of a billion. The comparative cost of conventional explosives is given as two to three billion dollars. If nuclear explosives were used they would probably do 95 percent or more of the job. Conventional explosives might be used for some of the clean-up.

Q. Concerning ROVER, is there less confidence now, and are budget limitations hurting it? Are you happy with the money available?

A. We are happy with the money now. It is the right amount for the time scale required. The manned mission to the near planets using nuclear rockets would probably come in the 1980's, probably the late 1980's. Furthermore, the President has been interested in the nuclear rocket program since the beginning. You remember, as Vice-President he was Chairman of the Space Council, and he showed great interest. A few years ago when there was a question as to whether 75 to 150 million dollars should be made available, he decided with Mr. Webb and me for the $150,000,000 in funds for AEC and NASA for this program.

Q. Back to the California reactor project. I understand Rickover says the design problem might be solved by September. Can you give us odds as to whether that will be done?

A. I am not familiar enough with the details to give the odds. The major problem is that the cladding expands on the elements. The question is, can the scientists and engineers redesign to get the nine-year life. This is a fantastically long lifetime, but it is possible. I think the problem will be solved, and it might be solved by September.

Q. If not by September, what will happen to the project?

A. If it is authorized, then the question is whether the State wants to go ahead. Or the AEC might find another partner. This is extremly important to the civilian nuclear power reactor program in the United States. It is so because of the possibility of breeding with ordinary water and is the only type that will do this, based on water technology.

Q. Does a specific amount of money have to be authorized by Congress for this, and how much?

A. Yes, we are asking $91,000,000 authorization and appropriations of $31,000,000, of which $12,500,000 is for fiscal year 1966. We expect to overcome the technical problems.

Q. The chemical trade press would be interested in how chemicals fit into the peaceful uses and space programs of the Commission.

A. Chairman Seaborg recounted various areas in which chemistry and the industry now play, and will play, important roles, especially noting the key role of chemical reprocessing in the civilian nuclear power reactor program. He said AEC was looking forward to construction in the west of a private processing plant, remarking one is already under way in New York (NFS). He mentioned encapsulation of isotopic

sources and said Martin Marietta-U. S. Rubber were building a $9 million plant at Richland. The whole nuclear industry is either in private hands or destined to be, he added, except possibly enrichment of U-235, and even this phase might some time in the future be in the private domain also.

Q. There is a big hole at Bodega filling with water. What changes could be made in procedures to have avoided that?

A. AEC's role in this case was strictly regulatory over a proposed private venture. The Regulatory staff operates independent of the rest of the AEC staff, similar to such regulatory agencies as FCC, FPC, etc. They provide a thorough review of all data relating to a proposed power reactor. There is an independent review also by the ACRS over which the AEC exerts no control, and a Licensing Board conducts a public hearing. Then the issue of whether a construction permit or operating license should be granted is determined, with the Commission itself having the final say. Whether the procedures can be speeded up is a question now under review. They probably can. But at this stage of development we have been extra cautious and each request has been gone into very thoroughly.

Q. Should PG&E have waited longer before it applied?

A. No. Because the Company went ahead ant its excavation revealed the problem.

Q. Was the special study of regulatory procedures triggered by the PG&E case?

A. No. A special panel was set up to look over our experience to date and the question of whether after several years the industry had matured. But we won't make any changes that would jeopardize public health and safety. We s[illegible] assure a thorough review. The question is, can the time for revi[illegible]e shortened.

Q. Concerning the Plowshare excavation interest by the Soviet and future needs for the limited test ban treaty, do you foresee any problems in obtaining such modifications needed for major projects?

A. We are optimistic that the Soviet and many other nations are showing great enough interest in Plowshare so that we hope we may get necessary modifications at the proper time. There is the matter of self-interest here. But any such modifications must be consistent with the primary purpose of the limited test treaty--prevention of atmospheric testing of weapons.

Q. As to the chemical industry in northern California, will peaceful applications of nuclear energy have long-range effects on plastics and wood products, too?

A. Yes, this is possible. (Note the Chairman's speech mentioned several.)

Q. Will the AEC speed up or slow down developments in new uses for plastics, wood products and other products according to economic impacts which might result?

A. We shall work cooperatively with industry.

In the final question, KRON (Art Brown) asked Dr. Seaborg to comment on remarks attributed to Dr. Teller in San Diego that nuclear warfare would not wipe out the human race. Dr. Seaborg replied he knew nothing about the speech and therefore could not comment.

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(Note: The delivery of Dr. Seaborg was smooth. It is regretted that in hasty notes his flow of language has been made to appear choppy, which it was not.)

cc: (IN TURN)
1. E. C. Shute, Manager
2. T. A. Nemzek, Deputy Manager
3. P. M. Goodbread, AMA
4. R. H. Ball, AMTO

J. B. Radcliffe, Director, RD, SAN
J. F. Philip, Director, SPD, SAN

COPY

GOVERNMENT OF INDIA
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Discussion between Dr Glenn T. Seaborg, Chairman, U.S. Atomic Energy Commission, Nobel Prize Winner and Shri H.N. Sethna, Director, Bhabha Atomic Research Centre, Trombay on "The Peaceful Uses of Atomic Energy"

1[illegible]/1/1967

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Dr. S. I have before me Dr Glenn Seaborg, Chairman of the United States Atomic Energy Commission who is here on a short visit to India in connection with the renaming ceremony of the Atomic Energy Establishment, Trombay.

Dr G.S. I am very happy Dr Sethna to be able to visit India for the first time. Actually, I have looked forward to this for a very long time and I was happy when Dr Sarabhai, the Chairman of your Atomic Energy Commission invited me and my colleagues to this renaming ceremony in which your Prime Minister is going to participate.

Dr S. Well, you were out at Trombay today, Dr Seaborg, what are your impressions of Trombay?

Dr G.S. I have quite favourable impressions. As you know, I saw the regional research reactor up there and the CIRUS Research Reactor as you call it which is the focal point for much of the excellent work of your physicists and the means by which you are producing radioactive isotopes for use throughout India in medicine and agriculture. And I also saw the Plutonium Plant and the Isotopes Laboratory and production facilities, as well as your fine Electronics Laboratory where I was able to view first-hand the work that is going on there to produce all of the electronics instruments and equipment that you use in the laboratory.

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Dr S. You are going to visit Tarapur tomorrow, Dr Seaborg, and you might be interested to know that certain amount of instrumentation for Tarapur has been made at Trombay.

Dr G.S. Yes, I did learn that Trombay not only fills the needs of the Trombay Atomic Energy Establishment itself but the needs of other associated Atomic Energy operations in India and as a matter of fact it serves in that one sense as a training ground for much of the electronics industry in India as I understand it that once instruments have their production methods developed there then they do spin off into Indian industry to carry on the larger-scale production.

Dr S. Yes Sir, we were most interested the other time to read about your new power Reactors which are going to be put up by the Tennessee Valley Authority. I understand the costs of power production there would be rather low with these very large units. I think it's about twelve hundred megawatts or something.

Dr G.S. Yes, well something like that-One thousand eleven hundred megawatts. Actually, the cost of the nuclear power to produce electricity in the United States has become economically competitive with the cost for the production of the electricity using fossil fuels such as coal and oil and gas, and this has been dramatically illustrated by the fact that just this last year, our utilities in the United States have contracted and they did this on the basis of the fact that it is cheaper because they are free to make the choice and they make it on the basis of economics, have contracted for the construction of about 20 million kilowatts of nuclear power and that was just during 1966 and this to our surprise was greater than the amount of conventional power that was contracted for during 1966 by our

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utilities and I believe that nuclear power is going to play a similar role throughout much of the world and in particular in India. I think India is a place where nuclear power is bound to play an important role in view of the relatively high cost of your fossil fuels and the relative limitations of your potential in hydro-electric power, although you have potential there when you compare it with the tremendous requirements for electric power in India in the future, and I think that hydro cannot fulfil that need, not even a fraction of that. Nuclear power is bound to play an important role in India in the future.

Dr S. Yes Sir, especially when you consider the vast population and if you even give them a tenth of what power is used by the average American, you would realise that it is just impossible with our present fossil fuel and the hydro potential to satisfy even a 100th part of it, and to increase our standard of living one has to go into some sort of cheap power and we feel that the only cheap power which we can possibly get would be from nuclear reactors. As you know, we are putting up besides Tarapur, there are two reactors of 200 megawatts in Rajasthan, and at Rana Pratapsagar and two more of 200 megawatts at Kalpakkam in Madras. This is a very small percentage I agree with the total power generated in the country, but we are just at the beginning, I mean we have just started whilst you had nuclear energy in your country for quite some time now.

Dr G.S. Yes, but it has just shot up fast in this last year. Just a few years ago, in 1963-64, our utilities committed themselves to only about two million kilowatts of nuclear power, in 1965 perhaps 5 million kilowatts, then in 1966 - 20 million kilowatts, and we do predict that construction of this will lead to a total of about 10 million kilowatts on the

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line in 1970, more than a 100 million kilowatts on the line by 1980, and we expect that by the end of this century by the year 2000 that nuclear power will be the only source that the utilities will construct as they meet their future demands.

Dr S. But some people mention that one may run out of uranium, especially low cost uranium which is now - people talk about at a figure of 8 dollars a pound, and that is likely to run out by the end of this century if this figure is reached. Is that your view point?

Dr G.S. Yes, I think so, but we have a programme that will make it possible for us nevertheless to use, continue to build nuclear power plants and there is a programme to build advanced reactors and even Breeder reactors that use the uranium fuel more efficiently. These reactors that you are building in India and that we are building in the United States as you know only utilise about 1% of the uranium fuel. These reactors that we are developing for the future, the Breeder reactors for example will utilise essentially all of the uranium fuel and when you do that then you can afford to use higher priced uranium and you get more other uranium at the same time, so that under these circumstances we believe there is enough uranium to satisfy the power requirements of the world for hundreds of years to come.

Dr S. That means you don't feel that what we feel in India very frankly is that we will have to go on to the thorium cycle sooner or later because thorium reserves are somewhat larger than uranium reserves at least as far as this country is concerned, possibly as far as the United States is concerned too.

Dr G.S. Well, we do not know that of course that our thorium reserves are larger, in the case of India this is clearly

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the case certainly on the basis of what you know about your reserves and the thorium cycle is another cycle in addition to the uranium cycle and the United States is developing both cycles that we will if we have enough power on the basis of the uranium cycle, enough fuel to last hundreds of years, then if we had to have the thorium cycle, then we will have double of hundreds of years. So we are developing both cycles.

Dr S. Well, that's interesting. To turn to another subject, Dr Seaborg, what is the status of affairs as far as food preservation by use of gamma rays?

Dr G.S. Well, we have in the United States a programme to try to develop the use of radiation like gamma rays, for the preservation of food to increase the short life of perishable foods like fish for example, which are so important to the people of India and their food problem. We also have a programme for the use of radiation for disinfestation of grain and as you know our two Atomic Energy Commissions are collaborating in this programme and one of the results of our present visit to India is to explore further with you and your people means of increasing this collaboration.

Dr S. Yes it is. It's very interesting that two of the world's greatest Democracies, the largest Democracies, have got together on this very exciting field and I am sure that this collaboration will be something much more than merely in the scientific field of atomic energy.

Dr G.S. Yes, I think so. I think this is just one area; I think as I believe you do, that Science is a sort of an international language and serves as a means of leading to an increased understanding between nations as well as to practical results such as we have some reasons to look foward to in the field of use of radiation for the preservation of food like fish and disinfestation of grain.

Dr S. Thank you very much, Dr Seaborg.

Dr G.S. Oh, it's been a pleasure, Dr Sethna.

Press interview held at the Argonne National Laboratories, Lemont, Illinois, on June 26, 1967, at 4:00 o'clock p.m.

PRESENT:

Dr. Glenn T. Seaborg, Chairman, U. S. Atomic Energy Commission
Mr. James T. Ramey, Commissioner, U. S. Atomic Energy Commission
Mr. Gerald F. Tape, Commissioner, U. S. Atomic Energy Commission
Mr. Delmar L. Crowson, Director of Division of Military Application
Mr. John V. Vinciguerra, Assistant General Manager for Administration, U. S. Atomic Energy Commission
Mr. H. Scoville, Assistant Director for Research and Development, ACDA
Mr. Henry D. Smyth, U. S. representative to the IAEA (Ambassador)
Mr. Myron B. Kratzer, Assistant General Manager for international activities
Mr. John T. Conway, Staff Director of the Joint Congressional Committee on Atomic Energy

Members of the Argonne National Laboratory
Members of the Press

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DR. SEABORG: The remarks are very informal. All I am going to try to do is set the stage for your questions. Commissioner Ramey and Commissioner Tape, Ambassador Smyth, and John Conway, the Joint Committee on Atomic Energy, and Mr. H. Scoville are the Arms Control and Disarmament Agency, and the rest of the staff, and I, are in Chicago to attend a meeting of a symposium on safeguards research and development which is being held here at the Argonne National Laboratories today and tomorrow. We think this is a very important meeting and symposium. It is the first such meeting that has ever been held in this context, and it is to discuss ways and means of improving our safeguards to prevent the diversion of fissionable material intended for peaceful purposes to military purposes.

I might begin by saying just a word as to what we mean by safeguards. Safeguards has become sort of a word of art. It is going to be a word that you are going to hear more and more in the future. Safeguards is a system of inspection and control to prevent the diversion of fissionable material to military purposes. This therefore means that it is a system of accountability for the material and a

system of physical security for this fissionable material. This fissionable material which is useful, of course, as a nuclear fuel and is produced as a by-product when nuclear power reactors operate to produce energy and heat, but which can also be used in certain forms as the explosive ingredient for nuclear weapons.

We have a large number of scientists, we would say the best talent in our country, assembled here to discuss this problem of improving these safeguards, of conducting research and development to improve the safeguards, and this group consists of about 150 scientists from all over the United States, from our AEC Laboratories, and from the universities and from industry. This problem is becoming of increasing importance due to the growth in the nuclear power industry in our country and throughout the world, and we are interested in providing an effective and efficient safeguard function with respect to the domestic uses of nuclear energy as well as the international aspects. I think a number of important ideas are coming out of the symposium, and the proceedings of the symposium will be published sometime in the future when the papers can be prepared for that purpose.

The importance of the safeguards can be

illustrated by the fact that we predict that by 1980 there will be produced as a byproduct in a sense, it is a product that can be used for further fueling of nuclear power reactors, but produced by nuclear power reactors which are producing electricity in this country and around the world, there will be produced a sufficient quantity of plutonium to fuel a nuclear power electric industry amounting to about 150 million kilowatts or alternatively enough to produce some tens of nuclear weapons a day. This then illustrates the importance of the problem and the importance of our finding the means to prevent with as much certainty as we can that this material is not put to military uses and kept in the peaceful uses field.

I think that is as much as I want to say as an opening statement. I would like to ask before we do ask for questions whether John Conway or Harry Smyth would like to say anything. I should say that the Joint Committee on Atomic Energy has had a great interest in this problem from the beginning. I should say that the United States has had a great interest in this ever since World War II, particularly as it concerns the international aspects, and perhaps I should say a renewed interest in recent months and years due to the

great increase in the growth of the nuclear power industry.

Harry, do you have anything that you would like to say?

MR. SMYTH: I would like to say one or two things if I may. I am glad to have this opportunity because I think many people do not know very much about the International Atomic Energy Agency to which I am the United States representative. It is an international organization connected with the UN, but having its own independent board of governors. It has, I think, 98 member nations now, and it has two functions defined by the statute. One is to promote the peaceful uses of atomic energy, and the other is to prevent insofar as it can the diversion of material intended for peaceful uses, to prevent or at least discover any attempt to divert such material to military uses.

Now, it is in that connection that the Agency has developed a safeguards system, a system of controls and inspection which has grown rather slowly, but is now accepted by quite a large number of countries, and which we hope may become more widespread. It will become of great interest perhaps if there is a non-proliferation treaty, and I would like particularly

to comment on the relation of this meeting here to the problems of the safeguards in the international agency because as I was saying to the group here this morning, when we are dealing with countries all over the world we have a problem of not just establishing a system that is effective, but of one that will be acceptable because many countries are concerned for a great variety of reasons about having inspectors from an international agency and so forth.

The purpose, therefore, from our point of view of such a technical meeting as has been held here, is being held here today, is, first, we hope that methods will be developed which will be more effective but also that methods will be developed for inspection and control that I will say would be less intrusive on the sensibilities of some of the countries around the world who are very sensitive to any, what they might call, invasion of sovereignty or interference with their industry or whatever. So I think the hope of technological developments from our point of view, from the point of view of the International Atomic Energy Agency, has these two features.

Thank you.

DR. SEABORG: This, of course, the subject of

safeguards, the inspection and control attendant with safeguards is very important in connection with the non-proliferation treaty, and you will recall that this was one of the items that President Johnson and Premier Kosygin discussed during their meetings on Friday and Sunday, and one of the areas where there was agreement that we should get on with the non-proliferation treaty as soon as we can.

Amplifying very slightly on what Ambassador Smyth has said, and he is the United States representative to the International Atomic Energy Agency in Vienna, this is the agency that we hope will carry out this safeguards inspection function if we do succeed in obtaining a non-proliferation treaty, and amplifying what he has said, it is the policy of the United States to have the safeguards functions in connection with our cooperative arrangements with other countries in atomic energy transferred to and carried on by the International Atomic Energy Agency. We are doing everything that we can to have them play that role for us with the hope that this will encourage other countries to have the IAEA, as it is called, play that roll because it is very important that internationally these safeguards be carried on by

such international agency. I think that we can begin the questioning.

QUESTION: Dr. Seaborg, is the new accelerator going to be built at Weston?

DR. SEABORG: I thought I would get one question on safeguards before we got to that.

The Weston site is the choice of the Atomic Energy Commission for the accelerator. We made our choice from among the six final states as you know, and that is still it. That continues to be the first choice of the Atomic Energy Commission.

QUESTION: Do you plan to enlarge it?

DR. SEABORG: Enlarge the site?

QUESTION: No, to enlarge the facilities in its capabilities.

DR. SEABORG: Enlarge the facilities? The Congress has made the suggestion that we design a facility that would be expandable to produce ions of energy greater than 200 BEV. That is it might start with a capacity to accelerate protons to 200 billion electron volts, but it might have features in it such that by later additions it could be expanded so that protons could be accelerated to maybe 300, 400, or 500 BEV,

billion electron volts.

QUESTION: If the Congress did make an about-face and move the site to some other area of the country, how much inconvenience would be involved for the AEC?

DR. SEABORG: The Congress isn't about to do that, I believe. That isn't part of the decisional process. I don't think there is a mechanism for the Congress to move the site in the way that you suggest.

QUESTION: You mean, sir, it is either Weston or no place at all?

DR. SEABORG: I didn't say that.

QUESTION: Could you clarify it?

DR. SEABORG: I answered the question, what would we do if the Congress moved the site, and I just made the point that I didn't think that would be part of the decisional process.

QUESTION: Let me rephrase it, Doctor.

What if Weston were knocked out of the box? How much inconvenience would this bring to bear on the AEC?

DR. SEABORG: Well, I think this is a decision and a consideration that the AEC will have to make if such an event occurred.

QUESTION: Dr. Seaborg, I have a question on

safeguards, but I also want to get a clarification on Weston. It isn't likely that our Legislature will pass an open housing law. At one time you said that if it didn't it would jeopardize the Weston site. Do you now mean that there isn't any relationship to the open housing law in the choice of the Weston site?

DR. SEABORG: No, what I said, and what Commissioner Tape and Commissioner Ramey said when we visited Springfield in April was that it was our assessment that the accelerator was in trouble with Congress as concerns the Weston site. That was our statement.

QUESTION: Dr. Seaborg, did the AEC have any assurance from the State of Illinois that there would be a guarantee of open housing?

DR. SEABORG: We asked all of the sites to give us, proposers of the sites to give us such assurances as they could broadly in the area of human rights. That is equal employment opportunity, equal school opportunity, open housing or equal opportunity in housing, and so forth. And we told them that that would be one of the considerations that we would come back with when the final choice was made. That is the way it actually proceeded in the course of the

selection process. I should say that in the case of the Weston site we have received assurances on all of these other factors concerning human rights. It is only in the area of open housing that we do not have legislative assurance as yet.

QUESTION: Sir, do you have difficulty in other AEC sites with getting housing for minority employees?

DR. SEABORG: Well, I think that there have been some problems at some of the sites, yes. Over the years I think it is improving considerably. You know that we have installations in Tennessee and South Carolina, for example, but I think that tremendous improvements have been made in such sites, and although these perhaps have not gone as far as we would like to see, they do represent a great deal of progress and particularly in recent years.

QUESTION: Dr. Seaborg, irrespective of what the Legislature does, Weston is the site, is that correct?

DR. SEABORG: No, I didn't say that. If the project is not authorized, that the funds are not appropriated, there is no way by which the Atomic Energy Commission could proceed with the building of the accelerator at the Weston site obviously.

QUESTION: Sir, if it were not, would you then

go to your second choice or would you have to start over?

DR. SEABORG: We haven't decided yet what we would do in that contingency.

QUESTION: You think the chances of Weston being turned down are remote?

DR. SEABORG: I don't really know that I should try to make a guess or assessment on it at this time.

QUESTION: Is Weston still in trouble with Congress, Dr. Seaborg?

DR. SEABORG: The situation in Congress, as you probably know, the bill that would authorize certain preliminary work on the accelerator came out of the, the authorization bill came out of the Joint Committee with a split vote, and now it has to pass in both the House and the Senate. That is the situation.

QUESTION: If I may get to your subject, sir --

DR. SEABORG: The safeguards?

QUESTION: Safeguards.

DR. SEABORG: I welcome it. I welcome that.

QUESTION: How can you have safeguards when China, for example, is not a member of the international group and you have no persuasive powers with China?

DR. SEABORG: Well, we are asked that question very often and maybe Ambassador Smyth is the better person to answer it. But we do feel that the problem is so broad and the need to stop the further proliferation of nuclear weapons so great, if we don't we get to a situation which eventually will become more and more difficult to control; that we should proceed with a non-proliferation treaty in the absence of China, and at this time France has also indicated she would not adhere to such a treaty, with the hope that the logic of the situation will become apparent to countries like China and that the obvious fact that in the long run that it is to her advantage as well as to the rest of the world will become obvious and therefore we are proceeding by going as far as we can, never losing sight of the Chinese problem, and hoping to come back to it and find rational behavior sometime in the future.

Do you want to add to that, Harry, or Pete?

MR. SMYTH: I will say one thing. It is hardly necessary to point out at this time that wars can occur between others than the great powers, and I think that we believe that the non-proliferation treaty might have considerable value in at least

keeping nuclear weapons out of such wars.

QUESTION: For example, Ambassador, how could you prevent Red China from giving nuclear weapons say to the United Arab Republic?

MR. SMYTH: Well, I am not an expert on the language of the treaty, but I think that would be covered.

QUESTION: Do you have a way of knowing whether the United Arab Republic has the technical ability to use a gift of this kind?

MR. SMYTH: I would rather they didn't receive it.

DR. SEABORG: Perhaps, Dr. Scoville, who is the Director of Research for the Arms Control and Disarmament Agency, would like to go back to the earlier question.

MR. SCOVILLE: Just a comment on the business of what effect it would have on the UAR. If the UAR signs the treaty, then it accepts the obligation not to acquire nuclear weapons, and so unless it violates the treaty it cannot receive nuclear weapons from China. So I would like to emphasize that the non-proliferation treaty is still of tremendous value even though China does not sign up. Just because China will not sign up is no reason why we should

run the risk of having nuclear weapons used in a repetition of the kind of situation we have been through in the last three weeks.

QUESTION: Sir, aren't you saying the good boys will be left without power and the bad boys will have all of the guns?

MR. SCOVILLE: I don't think so. We are not proposing in the treaty for us to give up our nuclear weapons. We are not sacrificing anything vis-a-vis with the Chinese. All it does is we agree we will not disseminate nuclear weapons to a country which does not now have them.

QUESTION: Dr. Seaborg, could you give us a hypothetical example of how plutonium could be diverted from a utility into the black market?

DR. SEABORG: Well, there is a certain limit to the accuracy with which the course of plutonium through a nuclear power plant or the nuclear fuel reprocessing plant, or what have you, can be determined, and the problem that we are faced with is to increase that accuracy and increase the degree of control so that there won't be any unaccounted for plutonium, but it would have to be some situation in which there was some unaccounted for plutonium,

and in that case, of course, some connivance with the utility, if you use that as an example, and a diversion, or at least with some of the people in the utility or perhaps more reasonably in the nuclear fuel reprocessing facility that would divert plutonium within this lack of accuracy margin, you see. And then we would, the agency or the United States, or whatever, would be making these determinations as to the course of the plutonium, and with the inaccuracies involved some of it could be diverted without our discovering it. I don't think this is a very likely situation at all that you ask. I just suggest, I just describe a hypothetical situation to show you how such a diversion could take place.

QUESTION: Doctor, when you were talking about the 1980 estimate, were you referring to the breeder reactors or those that are available now?

DR. SEABORG: I was referring to those that are available now. The type of reactors that are available now in the quantity that we project for operation in 1980.

QUESTION: Secondly, in the figure that you gave, tens of nuclear weapons, did you say a day?

DR. SEABORG: Per day, per day. In other words,

there would be an outpouring of plutonium of the order of one hundred or hundreds of kilograms per day over the whole world. I say outpouring, I mean it is produced in that amount, and of course in the normal course would then be reused in reactors of the type that are being used and planned today, or perhaps by 1980 there would be a beginning to using it in the breeder reactors. Undoubtedly there would.

QUESTION: Dr. Seaborg, what material effect will the AEC's revamped safeguard organization have on the Commission's work in this area?

DR. SEABORG: Well, an intensification of the work, the operation of closer standards, the development through research and development of better procedures for preventing through accounting and physical security and so forth the diversion of fissionable material to unauthorize uses. Just more people involved, more expertise involved, and an intensification of the surveillance process, both domestically and internationally.

QUESTION: And the most of this then would be done at IAEA?

DR. SEABORG: Not domestically.

QUESTION: No, internationally?

DR. SEABORG: Internationally. It would be our aim as time goes on to transfer more and more of the responsibility to the IAEA.

QUESTION: Domestically, AEC?

DR. SEABORG: Domestically, the AEC through the strengthened organization and organizations that we have within the AEC.

QUESTION: Dr. Seaborg, how wide do you consider this accuracy margin today?

DR. SEABORG: Well, that question is almost impossible to answer because of the complexity of the many places that determinations must be made. In other words, I can't answer it really in terms of a percentage margin.

QUESTION: This ad hoc panel report I understand was somewhat critical of the safeguards you now have especially in materials going to Europe, is that correct?

DR. SEABORG: Yes, well, I think that would be correct. It was their charge in a sense to look over our safeguards system and be critical. We asked these eminent experts to serve on this ad hoc panel, to look over our system with a fine tooth comb, and find whatever flaws they could find in that system

and then make recommendations for its improvement, and this they did. We have already put into effect a number of their recommendations and have under study the remaining recommendations.

MR. KRATZER: I think I might, if I may, add one point. I believe the criticism of the ad hoc panel went more to the question of the procedures by which we verify the effectiveness of the safeguards that are applied in Europe, not the question of whether those safeguards themselves are good ones. The safeguards on material which we send to most of the Western European countries, the six countries which are members of an organization known as Euratum are applied by Euratum itself. It is an international organization which, ofcourse, includes France, West Germany, Italy, Belgium, the Netherlands, and Luxemburg. Several of these countries with their historic enmities are inspecting each other. And we through certain international arrangements review the safeguards which they have in effect and satisfy ourselves that they are good ones.

Now, as I say, I think that the criticism of the report went primarily not to the question of whether they were good ones because we think they are.

I believe the ad hoc committee felt that they were too, but they felt that we ought to have a little bit more information on which to base this particular conclusion.

DR. SEABORG: Thank you. That is Myron Kratzer who is the Assistant General Manager for International Activities of the AEC, and therefore it falls within his purview to watch over these international fissionable material possibilities.

QUESTION: Dr. Seaborg, is there an inherent commitment on the part of the United States or other nuclear powers that if a nation accepts safeguards that in effect it will come under a nuclear umbrella protection of one country or the other? I am thinking in terms of India. You go to India, say you accept safeguards, but if China starts after you the United States will give you nuclear weapons to take care of your defense.

DR. SEABORG: There isn't at the present time. One of the considerations for India signing the non-proliferation treaty that has been advanced, not necessarily as national Indian policy, has been that there be such a protection, but this is not the situation at the present time. Here again I think Dr.

Scoville might respond.

DR. SCOVILLE: This problem which is called the assurances problem has been raised by the Indians. They are not looking for unilateral assurances on the part of the United States for the supply of weapons. What they are looking for is some kind of an international understanding, particularly an understanding which we and the Soviet Union together would give some indication that they wouldn't be allowed to be threatened or attacked by nuclear weapons. They are very interested in maintaining this position of neutrality, and therefore do not want to have unilateral commitments from any one nation.

DR. SEABORG: I don't think they have made this clear yet as a national condition for adhering to the non-proliferation treaty.

MR. KRATZER: I don't think there is an intention to put this in the treaty as such, non-proliferation treaty as such. More than likely it would be done in some other form such as the United Nations, and probably would not mention India by name. It would be more of a generalized statement so that it covers everything.

QUESTION: Dr. Seaborg, the President and

Mr. Kosygin were both very optimistic about the possibility of a non-proliferation treaty being signed. Why should they feel so now and what are the areas of disagreement remaining to be worked out?

DR. SEABORG: Well, I don't know how you would classify their degree of optimism, but we are in my opinion fairly close to an agreement with the Soviet Union on a non-proliferation treaty. One of the areas that still needs to have some differences resolved is in this area of safeguards, mandatory safeguards with inspection rights. This is the so-called Article III of the treaty. The problem there is that the United States has the views of the Soviet Union on the one hand that would require that all of the safeguards be carried out by the International Atomic Energy Agency, and the views of its allies in Euratum on the other hand that would prefer that the safeguard functions be carried out by their own inspection capability in Euratum, which is also an international agency with a safeguards and inspection capability. We have a problem, there is a problem to be resolved there in connection with Article III, the safeguards function, which there appears to be at least a moderately good chance of resolving, and

then there are problems that have to do with the amendment procedures and perhaps problems in a couple of other areas that I think again Dr. Scoville could elaborate on.

DR. SCOVILLE: I think the main problem is the safeguards problem. I think the others are details which probably either have been or can be resolved. I can't speak for what happened over the weekend since I don't know.

QUESTION: Dr. Seaborg, recently the AEC released figures on the U-235 production at the gaseous diffusion plant, and one of the reporters went back to Dr. Smyth's report and computed from that we are producing approximately 480 weapons a year. Is that in the ballpark?

DR. SEABORG: I wouldn't be able to make a comment on that except to caution you that that would be using very crude information at this stage of development, some twenty-odd years later.

QUESTION: Can the Communists deduce our production from those figures?

DR. SEABORG: Our production of weapons?

QUESTION: Yes.

DR. SEABORG: I don't think they could. He would

have to know more about the type of nuclear weapons that we are producing than we think he does. We are quite sure he does.

QUESTION: Dr. Seaborg, I seem to have read an article where I understand that sometimes it is to the advantage of a country to let the other side know what it is planning such as the anti-ballistic missile game. Is there some information you would like the Soviet Union, for example, to have about our capabilities?

DR. SEABORG: I don't know that I would be prepared to answer that. I think it is a good question, and I think that it is one that is debated. There certainly are pros and cons, you are right.

QUESTION: Dr. Seaborg, is it likely in the near future the AEC will require built-in safeguards in nuclear operations or power plants, fuel reproducing plants of any type?

DR. SEABORG: We are exploring what we call residence inspectors. That is perhaps as close to built-in safeguards as one can come, I suppose. We have the cooperation of four private companies in the nuclear business, nuclear fuel, nuclear fuel fabrication, fuel reprocessing, and so forth, in an

experimental program to try to ascertain how well such a system of residence inspectors will work out.

QUESTION: Is this, however, a consideration as a means of local or domestic control, this idea of built-in or residence inspectors? Is it a major consideration insofar as the AEC is concerned?

DR. SEABORG: Well, I don't know whether I understand your question entirely. I would say that it is a method of operating that we are seriously investigating.

MR. KRATZER: This is on a selective basis I understand.

DR. SEABORG: That is with four private companies and with cooperation, but it obviously could be conceived as having application in the international area. It has not yet been accepted in that area, but it certainly is conceivable as a method of operating.

MR. TAPE: I think if you mean by built-in devices improved instrumentation, automation of data, and certain processing facilities and so on, that, as the field develops, there will be more of that kind of instrumentation, and that instrumentation will be useful not only on the safeguards side but also to the

plant management because the plant management wants to know where the material is and what is happening to the material. This is very valuable material. So it is important for them to have a complete accounting and know precisely where it is as well.

QUESTION: Thank you.

DR. SEABORG: Actually, if I may add another sentence or two, this is one of the areas that we are trying to explore in this safeguards research and development symposium meeting held here at Argonne. Just what can be developed in the way of automated instrumentation to aid in the unobtrusive implementation of the safeguards function.

QUESTION: That leads me to one other question, a rather general one. What exactly do you think the workshop has and will, since it is still going on, accomplish?

DR. SEABORG: This workshop?

QUESTION: Yes.

DR. SEABORG: What we are trying to do is to in a sense pick the brains of all these experts. We are trying to interest these talented scientists and engineers in this problem so that they will go back to their laboratories and think about it and perhaps

propose research and development approaches to the problem in an area of developing more accurate methods of analysis, automated instrumentation, and physical security to mention just three of the important areas.

QUESTION: Dr. Seaborg, last April you said it was the AEC's assessment that the Weston site was in trouble in Congress. What is your assessment now that the bill is before the House? Is it the same or is it modified or what?

DR. SEABORG: What is my assessment?

QUESTION: Yes, now.

DR. SEABORG: Yes, I would say that in a sense our prediction in April has been borne out. Obviously there are some problems that have become manifest in Congress.

QUESTION: Do you still believe it faces trouble?

DR. SEABORG: Believe what?

QUESTION: Do you still believe the final selection of the Weston site faces trouble in Congress?

DR. SEABORG: Well, I would say that it is facing trouble in Congress, yes.

QUESTION: To the extent that the site is jeopardized?

DR. SEABORG: That I don't know at this time.

QUESTION: Sir, could, for example, Senator Pastore persuade the Senate it should go to one of the secondary sites? Could they make that decision or would they have to go back to a recommendation from either the Joint AEC Committee, your group, or someone else?

DR. SEABORG: I believe John Conway can speak on that.

MR. CONWAY: I think we should have it clearly understood, Senator Pastore on more than one occasion has clearly stated it is not his intention to have this go to another site. At no time has he made that recommendation that it go to another site.

QUESTION: Perhaps I have not read it as closely as I should.

MR. CONWAY: I think you ought to read the report that he issued when the bill hit the floor.

QUESTION: What does he hope to accomplish with a floor fight then if it is not to transfer?

MR. CONWAY: I suggest that you read the report.

QUESTION: Thank you, sir.

QUESTION: Dr. Seaborg, have you received any communication from Russia yet on whether they agreed

to the exchange of usage between their accelerators and ours?

DR. SEABORG: No, we haven't.

QUESTION: That has been officially communicated to them?

DR. SEABORG: I would say at this stage it has been a feeler more than an official communication.

QUESTION: I have one more question for Dr. Smyth. Do you think it is feasible to have safeguards and yet not infringe on what you call national sovereignty of other countries?

DR. SMYTH: Yes, I think one of the very important things that we have done and the British have done has been to put each country, each country has put a big power reactor in the International Atomic Energy Agency safeguards, I think this is also true of the British, and as far as we are concerned it has made no problem. Now, we had a meeting up in Massachusetts last summer, a year and one-half ago, and we were going to give the utility people a chance to tell us all their troubles with the safeguards system. They didn't have any trouble.

No, I don't think there is any real problem. There is an apparent problem. It is a psychological

problem. It is very important that the big countries submit their facilities to IAEA safeguards because this gets rid of the colonialism or relics of colonialism ultimately which we heard a great deal of two or three years ago and haven't heard recently.

QUESTION: Dr. Smyth, are the other nations spending as much time in studying the safeguards problems as the United States, Russia, or the British? We hear the French are not interested at all. Is the United States carrying all of the work load on this?

DR. SMYTH: I don't know what the Russians are doing?

DR. SEABORG: They are very interested. I think you can say that.

MR. SMYTH: They are certainly very interested. We have a lot more power reactors than any of the rest of them have. I think it is natural that we should help with the technology.

DR. SEABORG: I think it is safe to say --

MR. SMYTH: IAEA has such a small budget, we have such a small budget we don't have the money and facilities to do it.

in the non-proliferation treaty.

in the non-proliferation treaty.

DR. SMYTH: There is no question of that. They support it, and for the last three or four years they have supported, in the IAEA, in the Board of Governors they have given strong support to a safeguards system and to an extension of it.

QUESTION: Have they convened conferences like this to discuss it?

MR. SMYTH: I don't know. How would I know?

DR. SEABORG: We don't know. I wouldn't be surprised but what they might in the future.

MR. KRATZER: Their discussions show considerable discussion, their discussions of it in Vienna show a good technical understanding of it. They obviously have worked on it and considered the technical problems involved.

QUESTION: Is there any plan to put, say, two or three groups together to study this on an international basis under IAEA, with the Russians and ourselves meeting jointly to meet the problem?

DR. SEABORG: Doing it now, I think.

MR. SMYTH: IAEA is having a meeting of technical people in August to consider these problems. That will be an international meeting.

MR. CONWAY: The Joint Committee has recommended that the research be done by the United States with the Atomic Energy Agency, and with Euratum, other international organizations to do joint ventures.

QUESTION: Is the conference here a classified conference?

DR. SEABORG: I would say part is classified and part is unclassified. I would say two-thirds is unclassified and just about everything that took place today will be published. Well, everything that took place today will be published.

QUESTION: Dr. Seaborg, do you know if any of the Chinese scientists who learned reactor technology in this country, either Argonne or the AEC, have gone back to Red China?

DR. SEABORG: No, I don't believe there are any reactor technologists who have worked at places like Argonne that have gone back to Red China. There have been Red Chinese scientists trained in univeristies that are in Red China, in American universities, that are in Red China at the present time playing an important role in their weapons and incipient missiles program. Is that correct, would you think, John?

MR. CONWAY: Yes.

Brazil Trip
7/4/67

STATEMENT BY GLENN T. SEABORG
at
Press Conference
held in
Sao Paulo, Brazil
July 4, 1967

Yesterday I had the pleasure of visiting Rio de Janeiro and holding very useful and cordial discussions with officials of Brazil's Nuclear Energy Commission and Ministry of Foreign Relations.

These were in the long tradition of the close and friendly cooperation between the United States and Brazil in the peaceful uses of atomic energy which began in 1955.

We join in the pride you have in your nuclear energy program, the pioneer of its kind in Latin America, and we have been pleased to have been able to participate extensively in its development, both financially and technically.

My visit here today gives me an opportunity to see the first reactor to be completed in Latin America. In operation since 1957, this reactor, for which we have had the pleasure of providing nuclear fuel and financial support, under the "Atoms for Peace" program, has been the core of the Brazilian atomic energy effort. The United States proposed the "Atoms for Peace" program and has long favored and supported peaceful nuclear development in Latin America, because of our conviction that nuclear energy and its many applications can make a major contribution

to the economic development of Brazil and all of Latin America.

In our conversations yesterday, we reconfirmed our interest in expanding our cooperation with Brazil in the development of its independent capability in application of nuclear energy to the generation of electricity, desalting of water, the uses of radioisotopes in research, medicine, industry and agriculture, the preservation of food by radiation, the use of accelerators for research in physics, raw materials exploration and other important fields of nuclear energy. In return, our scientists benefit, as scientists all over the world, by the scientific findings that flow from the Brazilian nuclear program.

We held frank discussions on the difficult and complex issue of the application of nuclear explosives to peaceful purposes. There is a difference in the United States and Brazilian outlook on this question. Your officials and we took note of the fact that this is the only area in the whole field of peaceful nuclear cooperation in which the United States and Brazil are not in full accord. Even here, our difference is of a limited nature.

We are in complete agreement with Brazil as to the importance of full access of all countries to the benefits of the peaceful uses of nuclear explosives. We agreed

that these benefits could be realized only at some future date, if and when the necessary and difficult technological development is successfully completed.

The United States has taken the initiative in the important Eighteen Nation Disarmament Conference in Geneva, of which Brazil is a leading member, in proposing that the availability of peaceful nuclear explosion services to all countries be accomplished through the provision of these services from the nuclear states through an international body in which the non-nuclear weapon states would participate. Our reason for holding this view is a simple one: Every nuclear explosive device, even one intended for peaceful purposes, can be used as a nuclear weapon. Since this is so, nations which believe, as Brazil and the United States do, that there should be no further spread of nuclear weapons could find their hopes frustrated if additional countries begin to develop nuclear explosive devices. But while our primary reason for believing that the important objective of ensuring access to the peaceful benefits of nuclear explosives should be achieved as I have just outlined, it is important to note that this approach is also more advantageous to countries who would have these services. During our talks, I had the opportunity of pointing out that such services would be provided on a completely non-discriminatory basis. The charges which the United States will make to our partners abroad will be identical to the charges which we make to

users in the U.S. itself. Let me also emphasize that these charges will entirely exclude the billions of dollars which the United States has already expended for the development of nuclear explosives and will only cover our actual costs for the materials consumed and the fabrication of the devices. I was pleased by the expression of satisfaction by Brazilian officials in learning of this aspect of the U.S. policy.

For these reasons, there can be no doubt that the procurement of peaceful nuclear explosives by Brazil in this way would be far less costly - far quicker and far more certain - than the development of nuclear explosive devices here.

Thus, our difference of opinion is limited to the area of the means by which the availability of peaceful nuclear explosives should be assured. It does not in any sense involve the question of whether they should be available - a point on which we are in full agreement.

I am confident that this limited but important question can be resolved in the same spirit of effective cooperation and good will which are the cornerstones of the partnership of our two countries.

DR. SEABORG's PRESS CONFERENCE -
SEPTEMBER 28, 1967 - 11:00 AM
INTERCONTINENTAL HOTEL - VIENNA, AUSTRIA

Opening Statement by Chairman Seaborg:

Thank you, Bob. My colleagues and I are happy to meet with you again in Vienna. This is the seventh conference of the International Atomic Energy Agency that I have attended. I think that is true also for Ambassador Smyth, and perhaps Dr. Rabi - he has attended more - he started before I did.

And this is the seventh press conference that we've had the pleasure of holding in connection with our attendance at the General Conference in Vienna. We're again gratified by the excellent turnout - it is symbolic of the interest in the important work of the IAEA. I believe that the work of the IAEA is becoming of increasing importance because of the role that it is expected to play in connection with the safeguards function for a non-proliferation treaty if consummated and also because of the increasing importance of nuclear science and nuclear energy developments in general throughout the world, and because of the role that the IAEA is playing in making this available to the countries throughout the world. I think that we are ready, I hope, to entertain any questions from the press.

1. QUESTION. (Baer, Nucleonics Week) How do you see the current political positions or the position either in Geneva or New York in regard to an early conclusion for the NPT.

DR. SEABORG: Well, I'm optimistic about the ultimate attainment of a non-proliferation treaty; but I don't know what you mean by "early conclusion." I would hope that it could be concluded during the present session of the 18 nation disarmament conference, that is, that an outline of a treaty could be agreed upon before conclusion of the present session.

2. QUESTION. (Meysels, Wochenpresse) Do you see any point in the IAEA taking over a control function when countries like China and France may not sign a treaty? Could the control of nuclear carriers or the proliferation of finished warheads come under the control agreement.

ANSWER: Well, I'll attempt to make a response to both of your questions. I definitely see a point to a non-proliferation treaty with a control article even in what I hope is a temporary absence of France and China at the beginning. I think that it is very important to stop the proliferation of nuclear weapons and that, of course, is the aim of the non-proliferation treaty. Now your second question was ...

QUESTION: Could the IAEA also possibly control the proliferation of warheads or atomic carriers.

DR. SEABORG: I think that it is premature to make a judgment on that. I think that we should do what we can to consummate the non-proliferation treaty.

3. QUESTION. (Swensen, Swedish Radio and TV) It struck me in listening to the speeches made here so far that both the Director General and the Soviet Delegates spoke only of the I.A.E.A. control of a NPT. There was no mention of whether or not Euratom is going to perform some control functions. Does this mean that this problem has now been settled? Or why isn't it mentioned? Or do negotiations go on (remainder inaudible.)

DR. SEABORG: Well, I think basically the important point is the inclusion of an effective safeguards article. And the means by which such a provision can be implemented are still under discussion. I wouldn't say so much in the forum here - this is a matter that is primarily the responsibility of the ENDC in Geneva. It is possible that some plan could evolve which would utilize the experience of both EURATOM and the IAEA. Both organizations have had extensive experience in the field of safeguards and already possess highly qualified personnel.

4. QUESTION: (Dornberg, Newsweek) The Soviet delegate spoke yesterday about EURATOM being a very limited organization. Would you interpret this as a rejection of the compromise proposal that there be a three year period when they jointly inspect the countries of EURATOM.

DR. SEABORG: No, I wouldn't. I believe that there have been more positive indications in Geneva in this regard.

5. QUESTION. (Anneliese Schultz, Daily Telegraph) Have any private exchanges been going on between you and your Soviet colleagues here or any other colleagues here in regard to Article 3 to find a compromise there.

DR. SEABORG: No, I haven't had any private exchanges yet concerning Article 3. I don't know about my colleagues.

6. QUESTION. (Schumacher, West German Press) Coming back to the relations between IAEA and EURATOM how is the situation about the so-called "guillotine" phrase - has it been maintained or has it been dropped by the US?

DR. SEABORG: Well, I am not sure that the guillotine phrase is an apt description of what was considered earlier, but if I understand it correctly neither the Soviet compromise arrangement nor the earlier U.S. draft contains such a provision.

7. QUESTION. (Anneliese Schultz, Daily Telegraph) Do you foresee in this General Conference any public attempt by the Soviet Union to get a statement from the Conference in favor of a speedy conclusion of the NPT? There are reports and indications that they are circulating a resolution to that effect.

DR. SEABORG: Well, we have also heard that the Soviet delegation is considering the possibility of such a resolution but our understanding is that they haven't yet decided if this is the proper forum for that or not.

8. QUESTION. (Swensen, Swedish Radio and TV) Earlier this year, that is in February, there existed one Soviet draft and one American draft of the safeguards which were very similar if not almost identical. Now, if you see a certain movement toward an agreement does this mean that you are now turning to a certain extent to the position on the control issue (not audible).....

DR. SMYTH: I think I understand the question - I'm not sure what the answer is.

DR. SEABORG: Myron, why don't you .....

MR. KRATZER: I think that perhaps I could comment on your question. I think that there is some misunderstanding about the status of this Article 3 in the draft NPT not only at the present time but throughout these months of negotiation in Geneva. As you know, identical drafts of the treaty were tabled by the two co-chairmen, the United States and the Soviet Union about a month ago. They contained no article 3 - there never has been - and this I think is the important point - an agreed draft even privately on Article 3. This is a very complex negotiation which both the Soviet Union and the United States as

co-chairmen of the conference are consulting not only with each other but with many of their friends some of whom were represented at the 18 nation Disarmament Conference and a number of whom - necessarily because it is only that number of countries - are not represented there. Now what happens from time-to-time is that drafts are exchanged between the two for purposes of consultation with allies or friends but there has never been an agreement to this Article.

QUESTION (continued) I can be a little bit more specific - I am referring to (inaudible).....the American Ambassador to Brussels handed over to the (inaudible).....and at the same time there existed a Russian draft.....

ANSWER: MR. KRATZER: I'm sure that what was handed over was not a draft article to which the United States had agreed but an article which it agreed to consult with its allies. I think there is a difference.

9. QUESTION (Dornberg, Newsweek) The Soviet delegate yesterday made some comments about a 10% increase in the budget being excessive. What, Sir, would you consider would be a ligitimate budget increase if the Agency were to handle inspection under the NPT? How much would this involve?

DR. SEABORG: Well I haven't made a study in terms of the actual amounts of money that are involved but I would hope that the budget would be large enough to provide for the safeguards function. I think that this is very important, and by the way, it is in my opinion, within the capability of the IAEA to do this without employing an inordinate number of personnel.

QUESTION (Continued) May I add to that question. Did you see in that statement yesterday any possible indication that the Russians might want to weaken the effectiveness of the Agency in its inspecting role once there is a Treaty?

DR. SEABORG: Not at all. Safeguards is only one function of the IAEA and as I interpreted the statement by the Soviet delegate yesterday, they were advocating a decrease in other functions of the IAEA, and I believe you could even interpret his statement as indicating that the money saved in that manner might be applied to providing for an effective safeguards function.

AMBASSADOR SMYTH: May I just comment on that. It is my impression....I really want to enforce what Dr. Seaborg said. That their comments on the budget had to do only with the present obligations of the IAEA and were not relevant to any possible additional obligations. I do not want to speak for the Soviet Union - I say that is my impression.

ANSWER: COMMISSIONER TAPE - If I recall the statement of the delegate from the USSR in the budget and program session yesterday afternoon, he recognized that in areas such as safeguards, if the Agency is to do more work, it will be necessary to increase the budget, and his sharp attack on areas of the budget came in areas such as the contingency item and some of the administrative areas, but he did recognize that if there are areas of the Agency program which are to be increased and strengthened, that will take more money.

10. QUESTION: (Anneliese Schultz, Daily Telegraph): Do you feel there is any justification for the Soviet complaint yesterday that inspectors from Communist countries are not sufficiently used in inspection roles in the safeguards sector?

DR. SEABORG: I don't know that there has been enough experience with inspectors yet to draw that conclusion. As I understand it, there is a provision in the safeguards area that allows the country being inspected to eliminate inspectors from countries that they feel would not be to their national advantage. I don't know how often that has been used.

QUESTION: I understand that this is only a sort of taking over from diplomatic usage but not fixed - only a usage but not provided for.

ANSWER: COMMISSIONER TAPE - I might add one more point to what you have said. I think one of the difficulties at the present time is that the inspections are all in the western areas, none of them in the eastern areas, and until there gets to be somewhat more of a balance between the two, I think one will always estimate that there may not be quite a balance in terms of inspectors. It's a practical matter as I see it.

11. QUESTION: H. Benedict, AP: Are any inspectors from Communist countries on duty in western countries or anywhere?

ANSWER: COMMISSIONER TAPE - From a discussion I had the other afternoon, I believe I recall correctly that a Soviet inspector has been used in some Scandinavian facilities.

12. QUESTION: (H. Swenson, Swedish Radio and TV): I wonder whether you would be able to evaluate the real significance if there is any ... of the Soviet Bloc countries to accept inspectors from the .... regardless of the balance ... Do you think that this is of any practical significance because Russia has conducted a non-proliferation policy like yours?

DR. SEABORG: Well, it might be true that the Soviets have made an early suggestion for a non-proliferation policy in the eastern European countries, but the problem here is that as nuclear power reactors are built, they will produce plutonium as a by-product which can be used as the explosive ingredient in a nuclear weapon. Thus, although there aren't very many

power reactors in the three countries involved in this offer, it's importance results from its application to the future because nuclear power will inevitably build up in those three countries.

13. QUESTION: (Anneliese Schultz, Daily Telegraph): Have any Soviet Bloc reactors ever been offered to inspection apart from those in NATO countries?

ANSWER: I believe not.

14. QUESTION: Dr. Tape, I just wanted to make sure, you first said you believed there was no inspection in the West by any Communist inspector or official. On the other hand, you thought there was a Communist inspector in Scandinavia.

DR. TAPE: Let me try to clarify that. I said the inspections have been in the West, not that there was no inspection in the West. The inspection ... And then I said in response to more detailed question, Have Soviet inspectors been used, and I said "Yes, it's my understanding they have been used in Scandinavia." That's what I was talking about. Does that clarify it for you? (Reporter says - yes, thank you).

15. QUESTION: (H. Benedict, AP): My question concerns Romania. Is Romania still interested in purchasing a reactor in the United States? What is the situation at this time?

DR. SEABORG: Well, I believe that Romania is interested in including the United States among those who might be asked to furnish bids for a nuclear power reactor. Does that answer your question?

16. QUESTION: (H. Swenson, Swedish Radio and TV): I wonder if you could answer a question. I think this is within your terms of reference. Do you think that McNamara's announcement of the development of an AMB system with the attached explanation that you are not going to violate the Moscow Treaty and that you are going to do the development only in the West....Does this mean that you are referring by indication to increase status of underground testing? This is my question - Don't you think this announcement will delay the negotiations and possibly to conclude a comprehensive test ban?

DR. SEABORG: I don't think that it will increase our rate of underground testing. It will of course have an effect on the quality, the kind of underground testing that would take place. I would hope that the nations who might become signatories to a non-proliferation treaty would understand the reasons for this decision and that it would not contribute to a delay or in any way offer a roadblock to the signing of a non-proliferation treaty.

QUESTION (Continued): I meant a comprehensive test ban.

DR. SEABORG: Did you say a comprehensive.....well, it is still the policy of the United States that it favors a comprehensive test ban providing it has adequate controls, that is, adequate on-site inspections to insure that all nuclear testing has, in fact, stopped.

17. QUESTION: (Meysels, Wochenpresse) Would the US delegation be opposed to the injection of purely political questions about the unavoidable Middle East. I am thinking of the Middle East issue which might come up.

DR. SEABORG: Yes.

18. QUESTION: (Baer, Nucleonics Week) Since we are in the Middle East now. A group of prominent Americans including former President Eisenhower proposed a key to peace in the Near and Middle East. That the US team up with other people to irrigate the arid areas in order to decrease political tensions by giving people a better chance to live and live productively. Have concrete steps been taken.

DR. SEABORG: Yes. First I might recall for you that President Johnson made this proposal in his talk to a meeting of educators in the State Department in Washington - oh, along about the 19th of June, I don't know the exact date. My personal view is that such installations could contribute to the alleviation of tensions by helping to remove one of the main causes of these tensions, namely the dispute over water, and also by perhaps

contributing some of the other benefits that I mentioned in my talk at the General Conference yesterday, that is the production in addition to electricity and in addition to the desalting of sea water, of fertilizer to increase the productivity of surrounding land to help provide food for the population, and perhaps other industrial uses. My personal view is that such plants would be very worth while. The problem of course is not really a technical problem and possibly not even an economic problem - it looks to be economically feasible but the problem is a political and sociological problem to arrange the conditions, of course including the financial conditions, under which such plants could be built. Nothing in a definite way has followed since the President's June proposal.

19. QUESTION: (Schumacher, West German Press) One question which is not so hypothetical. Do you think if there is no other choice that EURATOM should be sacrificed in order to save the NPT.

DR. SEABORG: I wouldn't attempt to answer that.

QUESTION: It's not so difficult as it sounds.

DR. SEABORG: Well, it may not be hypothetical but I do think that it isn't going to be required. I believe that there will be a solution that wouldn't require such a drastic measure. I don't believe it would be up to us to say - who would say that

EURATOM should be sacrificed. I think EURATOM would have the say on that with respect to their adherence to the NPT.

20. QUESTION: (Dornberg, Newsweek) In line with that, do you see the Treaty as a possible bar to some sort of future European integration especially for Germany with the "have" countries such as France? This has been the German line all along, that the NPT would harm or hinder eventual European integration because France as an atomic power could not be a signatory to the treaty in that they might then receive materials from France. Do you see the NPT as a bar to eventual European integration in line with the German argument? This has been one of the consistent German arguments that signatories to NPT would possibly bar European political integration at some future date because Germany as a signatory would then be barred but France is not a signatory and might be receiving materials from them.

DR. SEABORG: Do I see the NPT as a bar -

QUESTION: As a bar to eventual European integration, in line with the German argument.

ANSWER: Well, I don't see it - I'm just trying to understand more thoroughly the basis for your question.

QUESTION: Perhaps I can make it more clear. This has been one of the consistent German arguments that signature to a non-proliferation treaty would possibly bar European political

integration at some future date because Germany as a signatory power to the treaty would then be barred from joining in some sort of a political union with France which is not a signatory.

DR. SEABORG: Oh, I see what you mean. No, I don't think so. Furthermore I don't believe - in my personal opinion - I don't believe France's position is that permanent. I mean if we have a non-proliferation treaty and it is successful I would hope that France would eventually find it to her advantage to sign.

21. QUESTION: (H. Benedict, AP) What is your estimate of manpower and personnel required to do this NPT inspection job.

DR. SEABORG: I have discussed this with both Mr. Nakicenovic, the Director of the Division of Safeguards and Inspection of the Agency, and with Mr. McKnight, who is the Inspector General for the Agency, and they estimate that they would have to expand their personnel something of the order of 100 people to take care of the needs into the early 1970s. This would be in addition to the present staff of about 20 in the Inspectorate and, I think, another 9 or 10 in other parts of the Agency that have inspection responsibilities.

COMMISSIONER TAPE: 130. That's for the foreseeable future like the 70s - the early 70s, and, of course, this estimate applies only to the non-nuclear weapon countries.

DR. SEABORG: That is important. That is predicated on the application of inspection to the non-nuclear power countries - non-nuclear weapon countries, I believe, is a better way of putting it. This assumes good training and effective inspectors. It is difficult to project much further than that because the nature of the inspection function might change after that. It may be possible to shift it to more critical or crucial areas like the chemical processing plants so that you shouldn't project it beyond the early 1970s by assuring that the number of people will increase linearly with the increase in the total nuclear electric capacity. And it may become possible to do more by instrumentation as we proceed to acquire experience.

22. QUESTION: (Braimi, Kurier) Is there any figure available for the number of establishments that 130 people would have to inspect in the early 1970s. Just roughly.

DR. SEABORG: Well - I would turn to Myron Kratzer to see whether he has the figures.

MR. KRATZER: Well, an installation is such a flexible term - it can be very small research reactor, it can be a very large power reactor; but I think probably what we're talking about are several score large power reactors and probably half a dozen reprocessing and fabrication plants which are the installations which require a large bulk of the inspection

manpower. There already are dozens of installations if you count every research reactor and every laboratory where fissionable material is used and so forth. But if we look at the things that require the heavy burden of manpower then I think the numbers that I've estimated here are probably in the ball park.

QUESTION (Continued): If I may interrupt here Mr. Chairman. I would like to come back to the group of objections which exist to this NPT. One of them is that it would hamper industrial use and development of nuclear power. I think it would be most welcome if you could elaborate on that point. What is your attitude to these objections.

DR. SEABORG: I don't believe that it would hamper the use of nuclear power, and by this I mean the production of electricity through nuclear power reactors, and I don't believe that it would hamper the general industrial capability of a country if it signs the non-proliferation treaty. I believe that the type of industrial development that a country foregoes by foregoing the development of nuclear weapons is not very substantial, not very important, in the development of the civilian economy of a country. We could get into the area of the peaceful nuclear explosives - there we believe that the best route by far for a country is to take advantage of the possibilities for the furnishing to a country of peaceful nuclear

explosion services through an international body of some kind. These explosion services would be furnished at the lowest possible cost - and by that we mean the cost wouldn't include any of the billions of dollars that have been expended to develop these nuclear explosives.

QUESTION: Would it be intended that the IAEA would handle it.

DR. SEABORG: I deliberately referred in more general terms to an appropriate international body. My own personal opinion is that at the proper time the IAEA might turn out to be that appropriate international body but I want to emphasize that this hasn't been decided or perhaps even suggested as yet.

23. QUESTION: (Braimi, Kurier) There was a release by the Agency describing the difficulties of making desalinated water economically useable. I understand that this problem has been technically solved. What would be the cost of desalinated water.

DR. SEABORG: Well, like all short responses to a question like this, one isn't able to develop the complete picture. The problem seems to be on the way to being technically solved and it does appear that the water and electricity produced concurrently will be economic. This is provided that the reactor is of large size. We are planning to build in southern

California, the utilities there and the water distribution system, the Metropolitan Water District, a joint project - in which the Atomic Energy Commission and the Department of Interior is involved. This will be a dual purpose nuclear power plant that will produce one million eight hundred thousand kilowatts of electricity and eventually desalt up to one hundred fifty million gallons of water a day. This electricity will apparently be produced, depending on the costing principles used by the utilities, in the range of 3 to 4- 4½ mils per kilowatt hour. The projected cost of the water is 22¢ per thousand gallons. There are projections in the future for more advanced reactors and in larger sizes that cut the cost of this electricity down considerably and the cost of the water down considerably; however in the countries where this might be applied, such as India, and this is just an example, or the Middle East, smaller size reactors probably would be used at the beginning. Here the cost of electricity and the cost of the water would be higher but they would be competing with higher cost electricity and higher cost water from other sources, and it does look tentatively like they will be economically competitive in the smaller sizes that would be required in these countries in those areas - in those countries and surrounding areas.

24. QUESTION: (Anneliese Schultz, Daily Telegraph): To go back to non-proliferation unfortunately. Do you expect from this conference any statement at all that the Agency is willing or is the proper object to be the control authority? So far everyone has said this is right and we can use their system. Can we not expect any resolution in this conference?

DR. SEABORG: No I don't anticipate any resolutions to be adopted making such a statement but I do believe that the statement by the Director General was fairly definite on this subject. He certainly pointed to the capability of the IAEA to handle this and he welcomed, as I recall, the fact that reference was made to the IAEA as the agency that might handle this in the draft non-proliferation treaty.

25. QUESTION: (Hans Benedict, AP): In other words you do not agree with Dr. Morokhov that there is a need right now to study the aspects of such a job for the Agency and to make a formal study of it and to announce the results which Mr. Morokhov suggested to the Disarmament Conference of the UN. He said in this speech that the Agency should right now start studying the whole project which it looks as though the Agency has not yet done, and should submit the results of this study to the UN.

DR. SEABORG: Well, I have the impression that it is implicit in the general preparations in the Safeguards Division that such plans are being made.

26. QUESTION: (E. Reed, CBS, San Francisco Chronicle): It looks like this conference is coming to an end. This question is probably more of a personal nature. Do you find that your activities and pressure of your role as Chairman of the US Atomic Energy Commission interferes or prevents you from pursuing your personal and primary role as a scientist?

ANSWER: Well, I think that I manage to keep up very well, or quite well I guess I should say, in my own field, my own speciality, the transuranium elements. In fact, there are some aspects of my position that perhaps almost enhance my ability to keep abreast of this field. I am, for example, giving a talk tomorrow afternoon at 5:00 o'clock at the Physical Institute of the University of Vienna, - and I invite any of you who would like to come, - in which I will describe the most recent research on the transuranium elements and some prospects for research in the future and some ideas that I have for possible future research in the field of the transuranium elements. I visited just on this trip, as I do on all of my trips, a number of nuclear research laboratories. I visited the Petten Laboratory, as did Commissioner Tape, which is a EURATOM laboratory in Holland, and I visited the Wurenlingen Federal Institute for Reactor Research near Baden, Switzerland, as did Commissioner Tape, and I will be visiting the Cassacia Nuclear Research Center near Rome next Monday. At each place I gave a talk on the transuranium elements, emphasizing the

latest research in this area. I do believe that I manage to keep up pretty well in my own speciality.

--We will stay as long as you wish but if that's the end of it - thank you very much.

I think I should acknowledge the presence of Mr. Picker, the President of the Picker X-ray Corporation. Would you stand up Mr. Picker - who is a member of our delegation this year.

1/18/71

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

JAN 1[illegible] 1971

Chairman Seaborg
Commissioner Ramey
Commissioner Johnson
Commissioner Larson
Commissioner

PRESS BRIEFING TRANSCRIPT

Enclosed for your information is a copy of an uncorrected transcript of the Chairman's January 14 press briefing. We will make the necessary corrections before making general distribution of the transcript.

John A. Harris

John A. Harris, Director
Division of Public Information

Enclosure

cc: R. E. Hollingsworth, General Manager
H. L. Price, Director of Regulation

UNITED STATES

ATOMIC ENERGY COMMISSION

PRESS CONFERENCE

with

THE HONORABLE GLENN T. SEABORG
Chairman

1717 H Street, N. W.,
Washington, D. C.

Thursday, 14 January 1971
2:00 p.m.

CHAIRMAN SEABORG: Shall we start?

We appreciate your coming out to meet with us this afternoon. I don't have any startling announcement to make. We just thought we would afford you an opportunity to meet with us and ask us any questions that you would like to ask.

I thought I might begin by introducing those who are here with me. My fellow Commissioners and some members of the Atomic Energy Commission, some key members of the Atomic Energy Commission's staff.

On my left is Commissioner James Ramey. On my right is Commissioner Wilfrid Johnson. Just to the right of Commissioner Johnson is Commissioner Clarence Larson. To his right is our General Manager, Robert Hollingsworth. Further to my left here is our Director of Regulation, Harold Price. Sitting over in the corner is our Controller, John E. Bedessa; our General Counsel, Joseph Hennessy; and Lester Rogers, who is the Director of our Division of Radiation Protection Standards.

I believe that you have had handed out to you what could pass for an opening statement that I was going to make. I thought I would perhaps skip that.

You have had a chance, I believe, to look at it.

Also, along with it is some backup material concerning various AEC programs ~~in progress~~ that we have made

in recent years. Rather than read that opening statement, I thought that we would use the time to better advantage if I started immediately and asked for questions.

~~So let us~~, with all the help I have here, I should think that we would have all the brains that would be required to answer any question that you might ask, although I am not sure. So let's start with the first question.

QUESTION: Has your Commission taken any steps to insure that further underground testing in Nevada will not release appreciable amounts of radiation in the atmosphere?

CHAIRMAN SEABORG: Yes, we have. We are making a very careful study of the situation, a study that we thought is called for as the result of the Baineberry event on December 18 and we will be guided by that in order to see whether we need to change the methods, the already very careful methods for assessment that have been the practice in the case of each individual test that we have held in the past. Each individual test is the subject of a very careful evaluation.

We have a test evaluation panel that includes representatives from a number of other government agencies, including the Environmental Protection Agency, the Environmental Sciences Agency now with the EPA, and other government agencies.

Of course, they are in an advisory capacity.

The Atomic Energy Commission is responsible for the test and for the decision of whether it is carried on or not. A number of other evaluations are made by other panels. The test is carefully evaluated at headquarters by headquarters staff, first in a preliminary way and then, as the time for the test approaches, each test is ~~then~~ evaluated by the commissioners themselves, first in its early stages and then just before it is conducted.

We do ~~care~~ on what we think is a very careful evaluation procedure here but in spite of that once in a while an accident happens.

QUESTION: What attention has been given to the geologic condition of the testing region? Is it ~~overall~~ overly fissured?

CHAIRMAN SEABORG: No. Of this particular region?

QUESTION: Yes, sir.

CHAIRMAN SEABORG: No. It was not ~~overall~~ overly fissured. There was a special consideration given to the geological situation. Here the Geological Survey and the Coast and Geodetic Survey both are called in for consultation and this particular area seemed to be normal before the test so far as fissures -- so far as the possibility of fissures were concerned.

QUESTION: How did the accident happen, Dr. Seaborg?

CHAIRMAN SEABORG: We don't know yet. We are undertaking an evaluation and in the meantime have suspended testing until we can make an assessment and try to correct whatever the condition was. We usually do this after an occurrence of this type and try to learn from it in order to make it -- to take every step we can in order to prevent a reoccurrence.

QUESTION: Did this lead toward the Miniata program? Was this all part of the pretesting for that?

CHAIRMAN SEABORG: The Miniata program? That doesn't strike a responsive note among any of us.

QUESTION: Miniata, as I understood it, was supposed to be the bomb that was supposed to be tailored specifically for underground shots to help the natural gas industry. It was going to be fired some time this year.

CHAIRMAN SEABORG: Oh, no. This was a weapons test.

QUESTION: Had no connection with that at all.

CHAIRMAN SEABORG: Had no connection with the Plowshare program or the program to stimulate gas recovery from tight formations, which is a part of our Plowshare program.

QUESTION: What are your thoughts for Plowshare

in fiscal 1973?

CHAIRMAN SEABORG: You mean -- fiscal 1972?

QUESTION: Fiscal 1973.

CHAIRMAN SEABORG: That is the year after the budget that will be announced within a week or two. Well, my guess would be that we will be continuing with emphasis on what we call the underground nuclear engineering. That is that part of the Plowshare that has to do with developing means for recovering natural gas from tight formations, oil from shale, minerals from low grade ores and so forth.

QUESTION: Will it be on a fee basis where industry kicks in the major portion or will you continue --

CHAIRMAN SEABORG: Yes. I don't know whether I would call it a fee basis but I think from now on the underground nuclear engineering part of Plowshare will be on a cost -- the development program will be on a cost sharing basis, in which industry will provide more than half of the cost.

QUESTION: How soon will this be integrated into the working program?

CHAIRMAN SEABORG: That is what we are doing now. Rulison was conducted on that basis.

QUESTION: You don't foresee or you are not working toward a much greater role of industry accepting the cost.

CHAIRMAN SEABORG: Oh, yes. I would say as time

goes on industry will take care of more and more of the cost and finally it will be essentially all funded by industry if the methods that are developed are successful.

We will, of course, continue to furnish the explosives and ~~services and~~ handle the explosive services, but as time goes on, if one aspect is successful and is taken up by industry, I would expect that eventually they would pay all the costs, including the cost of the explosive.

QUESTION: Is Rulison an unqualified success so far?

CHAIRMAN SEABORG: It is too early to tell. We are testing both the amount of radioactivity in the gas as it flows out and the pressure of the gas and the amount of flow over a period of time. It looks pretty good up until the present time but it is too early to tell whether it is an unqualified success or not.

QUESTION: How soon after the proof of the pudding on Rulison would you think, Dr. Seaborg, that this technology could become an active technology for the natural gas industry?

CHAIRMAN SEABORG: I think it will be a matter of five or ten years, or something of that sort.

QUESTION: Dr. Seaborg, would you care to comment on the Atlantic Monthly article in this current issue where the AEC lowered radiation levels for human exposure with the

QI but established no recommendations for the present iodine 131 in milk and that there is one partial section in there that we will continue to build nuclear power plants --

QUESTION: What was the question?

QUESTION: We can't hear the question.

CHAIRMAN SEABORG: The question was directed toward the recent article, or coming article, in Atlantic Monthly by Paul Jacobs in which the author accuses the AEC of having inadequate radiation protection standards.

End #1

QUESTION: That is right, among other things.

CHAIRMAN SEABORG: Among other things.

(Laughter)

CHAIRMAN SEABORG: Well, it is quite an article. I don't agree with much of it, if any of it. It draws a lot of conclusions concerning the effect of radiation on people who were involved in testing some 15 or 20 years ago on a cause and effect basis, attributing cancers that were developed to exposures to radiation on an individual basis, which we think is not possible.

It speaks in terms of our lowering the radiation protection standards, which is a responsibility now that lies with the Environmental Protection Agency. A study is being made of the possibility of lowering these standards by a committee of the National Academy of Sciences. We think that the actual emissions from nuclear power plants are so low that they can't possibly constitute a health hazard, and I believe that we have a chart here that puts into perspective the radiation protection standards and the emissions from the power plants as they operate today.

Perhaps I could go up to that chart and run through that to give you some -- or should I not leave the microphones?

QUESTION: We would like you to stay with the microphones.

CHAIRMAN SEABORG: All right, I will stay with the microphones.

This is a chart that gives comparative information on radiation exposures and the information includes the relative role of background radiation and then our protection guide standards, medical exposures, and finally the role of nuclear power plants.

Let me start at the top. The annual whole body exposures from natural background radiation, which includes three sources roughly speaking -- that is, the radioactivity due to -- that is present more or less everywhere in nature, in this table or in the ground, in the house that you live in and so forth.

And then the second source is cosmic radiation.

Then the third source is the radiation in your body. Background radiation is about 50 percent the natural radiation present everywhere, about 25 percent in cosmic radiation and 25 percent due to the natural radioactivity in your body, which is mainly due to the natural radioactive isotope Potassium 40. That runs about an average of 100 millirems per year, 70 to 200. In some parts of the world that runs up to a thousand or more, 1600 -- actually, it runs as high as 9,000 millirems per year in some parts of Brazil.

The radiation guides for exposure to radiation which are a result of the recommendations, not of the Atomic

get exact names

Energy Commission, but the Federal Radiation Council and the National Council on Radiation Protection and Measurements, and the International Commission on ~~Radiation~~ Radiological Protection, ~~they~~ are all more or less in agreement, ~~are~~ that occupational exposure shouldn't exceed 5,000 millirems per year. An individual in the population shouldn't receive more than 500 millirems per year. And a suitable sample population group, a larger population group, shouldn't exceed 170 millirems per year.

Compared to medical exposures, you have the average chest X-ray -- this is to a localized portion of the body -- of about 20 to 500 millirem. This, of course, is not per year. Actually, medical exposures per year on the average, counting everybody in the U. S., is about 100 millirems per year. A figure is given there for fluoroscopic examinations. First detectable effects -- that is, acute exposures -- I have been talking only about chronic exposures so far -- comes at about 25,000 to 100,000 millirems. 25 to 100 R.

Cosmic radiation exposure to the whole body during a round trip flight from Washington, D. C. to the West Coast at, for example, 35,000 feet is about three to five millirem. The annual whole body exposure from typical operating power reactors to persons living near the site boundaries is about five millirems per year. The average

for persons living within four miles is less than one and the average for the entire population in the U. S. is less than one/one thousandths of a millirem per year.

I think this gives you a pretty good idea of the comparative radiation exposure picture and how small the effect of nuclear power plants actually is.

QUESTION: Dr. Seaborg, you say you find little agreement with the assertions of the article. Is there any controversy about the assertion that more than one hundred uranium miners have died of lung cancer because of exposure to radioactivity in the mines?

CHAIRMAN SEABORG: No. I think that is a true statement.

QUESTION: In view of that, and some of the other assertions, do you feel there is any need for the public at large to re-evaluate the risk/benefit relationship?

CHAIRMAN SEABORG: Yes, and I think that is being done as part of the debate that is going on today and also through reputable scientific bodies such as the National Academy of Science committee that is working now with the new Radiation Protection Standards group in the Environmental Protection Agency, and, of course, recently the Atomic Energy Commission has adopted as part of its rule-making procedure the rule that radiation emissions and the consequent exposure to people, radiation emissions from nuclear power plants,

should be kept as low as practicable.

QUESTION: What is the posture of the AEC then? Have you taken a firm position on the side of the benefit far outweighing the risk, or are you open to making a further determination in this area?

CHAIRMAN SEABORG: Our position is that the risk, as shown by these figures, is so small compared with other methods of generation of electricity that the benefit outweighs the risk.

Let me expand a little bit on this comparison of other methods of generating electricity.

Recently, last August, there was an article in Science Magazine -- I think it was in the August 21 issue -- by two statisticians at Carnegie-Mellon University in Pittsburgh, Lave and Seskin, that made one of the first scientific attempts to make an assessment of the price in health and in additional deaths that we pay due to air pollution.

They, on the basis of a rather careful statistical study, came to the conclusion that if we could reduce air pollution by 50 percent ~~to date~~, the life expectancy of a newborn baby today would be increased by three to five years. They came to the further conclusion that this reduction in air pollution would reduce deaths due to lung diseases caused by air pollution, cancers, emphysema and so forth,

by 25 percent.

They came to the further conclusion that such a 50 percent reduction in air pollution would reduce deaths and diseases from heart and circulatory disorders by some 10 to 15 percent. They came to the conclusion that it would reduce, on an overall basis, diseases to the extent of about 4.3 percent with a saving in America's annual medical bill of some billions of dollars.

Let me compare that with -- if I can, and this is going to be somewhat approximate -- with the health effects from the radioactive emissions of nuclear power plants.

Some estimates have been attempted in line with trying to do this on a statistical basis, and the figure that is used -- and I think is more or less universally accepted -- is that the effect of chronic radiation on large population groups on the average leads to a life shortening of about one day for each one thousand millirems, for one rem, in other words. Life shortening of about one day for each one thousand millirems.

If we accept the figure of one-thousandth of a millirem as the average exposure in 1970 of everybody in the U. S., that would be one million times less. One thousand millirems compared to one-thousandths of a millirem. So, that would be one-millionth of a day which is about one-tenth of a second. So, the average life shortening due to nuclear

power plants in the U. S. today is about one-tenth of a second. That is to be compared with that three to five years I mentioned earlier due to air pollution.

The reason I make that comparison, of course, is that assuming that we must have electricity -- and I think that is a good assumption -- nuclear power is the way to generate it, ~~that~~ because it has the least detrimental effect on the health of the American people.

Now, I don't want to say that all of the air pollution is due to the use of fossil fuel plants to generate electricity, but an appreciable fraction of it is, so that would account therefore for a much larger life shortening than nuclear power.

If I extrapolate the effect to some year in the future, say, the year 2,000, the estimates are that by the year 2,000, the average exposure to everybody in America, if there are no improvements in nuclear power plants -- that is, in capturing the effluents like krypton 85 -- will be about two-hundredths of a millirem. That means that the life shortening would be about 20 times as long -- per year, I hope I made that clear -- or about on the average, non-specific, from all kinds of diseases, would be about two seconds per person per year.

QUESTION: Dr. Seaborg --

QUESTION: Doctor, in covering some of these

public debates or discussions about radiation effects, and more recently the supersonic transport, as a layman I get the impression that on one side of the argument are government scientists and engineers defending a position and on the other side very often, though not always, are scientists from universities who are attacking the government. I was wondering if there are scientists in universities who agree with the government and who for some reason or other feel constrained not to step forward?

CHAIRMAN SEABORG: I think there are many scientists in the universities who agree with the government. They don't have the responsibility. The scientists in government hold press conferences and are asked to answer questions along these lines and obviously they are in the limelight in this matter.

I think there are many scientists -- I know I have many friends in the university who agree with the point of view I have just expressed.

COMMISSIONER RAMEY: There were 29 who signed a letter supporting the radiation standards during the past year. Most of whom were from universities.

CHAIRMAN SEABORG: Also, the National Council on Radiation Protection and Measurements have scientists from the universities among its membership.

QUESTION: Dr. Seaborg, didn't you have a very

good year last year in the number of orders that were placed for nuclear power plants?

CHAIRMAN SEABORG: Yes.

QUESTION: What were the numbers last year as compared to 1969?

CHAIRMAN SEABORG: I will give them approximately. This can be corrected, but about 15 last year for a total of about 15 million kilowatts, and about six for 1969 for about six million kilowatts.

And then going back to 1968 and 1967, of course, they were up around 20 plants, around 20 million kilowatts per year.

QUESTION: Dr. Seaborg --

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QUESTION: Why do we have such a dramatic upswing?

CHAIRMAN SEABORG: This is a part of the normal picture in the utility business. It is not confined to nuclear power. It is also the case with fossil fuel plants. They have a sort of cyclical pattern and it has happened in the past, and probably it will happen in the future.

QUESTION: Dr. Seaborg, in connection with that, Assistant Secretary of the Interior Hollis Dole delivered a speech the other day and in it he says that they forecast that by 1980 ten percent of the nation's anticipated energy supply will be provided by nuclear power. That seems to conflict with yours --

CHAIRMAN SEABORG: It does, and I have talked to Hollis Dole about this.

QUESTION: Can you reconcile that?

CHAIRMAN SEABORG: Yes. We predicted as early as 1967 -- and I will come back to this -- that there would be somewhere between 120,000 and 170,000 megawatts installed in the United States by 1980. This amounts to about 25 percent of the predicted installed capacity at that time, which was predicted to be about -- the median of that, the 145 or 150,000 megawatts, would correspond to 25 percent of the predicted installed capacity in the United States in 1980, which was predicted to be about 600,000 megawatts, and it is a little higher than that in terms of the predicted actual

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electrical energy furnished by nuclear power. In other words, the nuclear plants are predicted ~~beyond~~ to be on line a little higher fraction of the time than the fossil fuel plants.

Now, in order for it to be as little as ten percent, that would correspond to about 60,000 megawatts. If you add up the nuclear power plants that are now operating, which is a small number, under construction or contracted for by the utilities in the United States, this amounts to about 90 plants with a total installed capacity of 80 million kilowatts. That is just plants that are under construction and contracted for today in January of 1971.

So it looks like we surely will exceed 60 million kilowatts and the indications are that we will probably hit fairly closely 150 million kilowatts by 1980.

Now, there is one other point I would like to make in this connection, and that ~~is~~ concerns the statement that the Atomic Energy Commission has overestimated the amount of nuclear power that would be expected and that hence we have fallen behind and that this is one of the reasons for our blackouts and so forth.

I have the figures here of the estimates that we have actually made. In 1962, in the report to the President we estimated that there would be operating by 1970, 5000 megawatts and by 1980, 40,000 megawatts. What I am going to show is that we have never overestimated. We have always

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underestimated what has actually taken place.

In 1964 we estimated that by 1970 there would be 6000 to 7000 megawatts and that by 1980 there would be 60,000 to 90,000 megawatts; in 1966 we estimated that by 1970-71 there would be more than 10,000 megawatts and by 1980 there would be 80,000 to 110,000 megawatts and then in 1967 we estimated 150,000 megawatts.

The actual amount of nuclear power on the line by 1970 was about 7000 megawatts. Just about what we estimated in 1964, substantially more than we estimated in 1962. The amount that is now surely going to be on the line by 1970-71 is somewhere around 15,000 megawatts, just on the basis of the plants that are nearing completion, and we estimated more than 10,000 megawatts for 1970-71 in 1966.

In other words, the Atomic Energy Commission has not overestimated the amount of nuclear power that actually came on the line. They have underestimated it in every instanc

COMMISSIONER RAMEY: I want to add one other thing in that connection. Going along with our estimates, of course our estimates are based on surveys of the utilities and also discussions with the Federal Power Commission, and our estimates have followed pretty close to the Federal Power Commission estimates. They have been in the same general range.

QUESTION: Dr. Seaborg, when are we going to find

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an answer to the power crisis?

CHAIRMAN SEABORG: When? Well, not immediately, because there is a lag in our ability to put power on the line. It depends, of course, what you mean by power crisis. We may get through the critical years ahead without any black-outs. I do not know. There are various predictions on this. It is quite possible that we will, although it will be tight.

COMMISSIONER RAMEY: Some of the power crisis seemed to go away when they raised the price of coal. There seemed to have been none available, but when the price went up, then it seemed to get more available. They were blaming a part of that lag on nuclear power, but it did not seem to be nuclear power's problem. It seemed to be that the coal producers needed more money.

QUESTION: Dr. Seaborg, in your recent talks with the President were you given any indication as to whether the Atomic Energy Commission will exist in its present form two years from now? There is talk now of a new department of natural resources.

CHAIRMAN SEABORG: There have been no indications that the Atomic Energy Commission will not exist two years from now. There was some talk earlier last year as the result of some recommendations, some broad recommendations which included suggestions that would have affected the future of the Atomic Energy Commission, by the Ash Council,

mp5

that certain functions might be taken away from us or transferred or that we might take on additional functions such as becoming a national energy agency rather than an atomic energy agency. Those seem to be dormant now and the only change that was made was to remove from the Atomic Energy Commission the radiation protection standards function, which went on December 2 of last year to the Environmental Protection Agency with our strong blessing and endorsement.

We think that is the right place for that to be, that that might remove some of the criticism that has accrued to the Atomic Energy Commission, that they were setting the radiation protection standards as well as promoting atomic energy.

QUESTION: If I can follow that up, do you think we can have a national energy policy without a single national energy agency that -- has the AEC made recommendation along that line?

CHAIRMAN SEABORG: No. I will answer the last part of your question first. The AEC has not made any recommendations along that line. I have to answer that on a personal basis. I do not even know whether my fellow commissioners agree with me or not. I think that in the long run, and I do not want to try to estimate how long that will be, but it is not a matter of months, I think that the way to establish and implement a national energy policy is to have a national

mp6

energy agency, but I want to emphasize that is my own personal view. That is not an Administration view and perhaps not the view of my fellow commissioners.

QUESTION: Have you made that suggestion to the President?

CHAIRMAN SEABORG: I have not.

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COMMISSIONER RAMEY: I might express a personal view that there will probably have to be some transitional stages before you ever get to having an energy commission or an energy agency and that there is -- there are means available through interdepartmental panels or an interdepartmental council on energy by which research and development and other aspects of energy could be coordinated a little better.

We had a very successful interdepartmental committee on the siting of power plants, of all types of power plants that came out with this report on electric power and the environment, in which all of the energy agencies participated and the environmental agencies participated and it's possible at the policy level to get these groups together.

COMMISSIONER JOHNSON: I would like to add a word to that. When you talk about an energy agency, you have to decide where to split the pie. When you talk about raw energy and oil and gas and coal and uranium, and then there is the matter of processing that material and converting it to other forms like, for example, nuclear fuel.

Then there is a conversion problem where you burn the fuel and convert the energy from heat energy to mechanical energy.

After that there is the transmission problem.

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Someplace, if you have an energy agency, you have to define what that agency will -- no one has yet really in a refined way done that. There is a lot of work to be done.

QUESTION: Are you headed into a record nuclear weapons production period now?

CHAIRMAN SEABORG: Are we headed into --

QUESTION: A greatly expanding nuclear weapons picture?

CHAIRMAN SEABORG: No, I wouldn't say so.

QUESTION: We are told Congress will be asked to appropriate $265 million for a safety overhaul of the nuclear weapons producing facilities.

Can one assume from that that the public adjacent to those facilities for lo these many years has been overly exposed to danger and it took the Rocky Flats fire to dramatize that danger to the AEC?

CHAIRMAN SEABORG: I wouldn't say that at all. I don't think that they have been exposed to danger. We think it's prudent ~~that~~ after all these years, many of these facilities, you may recall, go clear back to just after the war.

Some of them actually to the war. And in the meantime there have been great advances in safety in the operations themselves and in fire prevention; and as a matter of just prudent -- as a matter of prudence and good

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business management we think the time has come to improve a number of these facilities.

QUESTION: If that much money --

QUESTION: Has the AEC evidence that indicates Israel tested or is about to test a nuclear device?

CHAIRMAN SEABORG: No.

QUESTION: Can you shed any light on the persistent speculation that Israel is working hard on perfecting an atomic bomb?

CHAIRMAN SEABORG: I don't think I can shed very much light on that. We don't have any evidence that has led the Atomic Energy Commission to that conclusion.

QUESTION: Dr. Seaborg, in his testimony on the Rocky Flats facilities, General Gillard called the thing old, outmoded, increasingly hazardous operation.

I understand you are remodeling there. Were the employees at the Rocky Flats installation ever endangered by these old outmoded facilities?

CHAIRMAN SEABORG: I wouldn't say they were endangered. I don't think the employees at Rocky Flats were endangered.

I think that, as I have indicated, with the passage of more than 15 years there have been so many improvements in the way of doing things that we can decrease the radiation exposure, already small, to even lower levels.

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QUESTION: Is it fair to call the buildings and facility there outmoded and hazardous?

CHAIRMAN SEABORG: I would say in the sense that he is using the word, yes. In the sense that we have -- I wouldn't have used the word hazardous, ~~Rude~~ - except relatively, that we can do much better than what is possible with the techniques that were installed when the building was built and in the intervening years.

There has been so much progress made in building materials, in ways of handling plutonium, and in fire prevention methods that we think that we should take advantage of them.

QUESTION: You mean this is an atomic age antique?

CHAIRMAN SEABORG: Well, yes, in that sense. Anything built 15 or 20 years ago in the industrial scheme of things is susceptible to a great deal of improvement.

QUESTION: Mr. Ruckelshaus at EPA which now has the radiation setting thing as you mentioned has said that he thinks the states should be permitted to go ahead and adopt stricter standards on emissions from the power plants and he said that since this decision came out on the Minnesota case.

I wonder if you would comment on that and how if that happened, would it interfere with your ideas about

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how nuclear power plants should develop in the next few years?

CHAIRMAN SEABORG: Do you want to comment on that, Commissioner Ramey?

COMMISSIONER RAMEY: I imagine this question arose in relation to the decision by the U. S. District Court in Minnesota which held that the federal government had preempted this area of regulation and the states could not regulate the effluents from nuclear plants by reason of the 1959 amendment of the Atomic Energy Act.

Well, I think our view on this is that the proper way to go about bringing about the role of the states in the regulation of nuclear power plants is in connection with this 1959 amendment, which took into account that over a period of time the states might exercise a greater role.

The purpose of that amendment was to permit the states to regulate radioisotopes that are produced in reactors, that are used on a large scale basis, and under that legislation the AEC has entered into about 22 agreements with the states for delegating to the states the regulation of radioisotopes.

In order for a state to qualify and enter into such an agreement they have to show that they have the staff, that they have the facilities, that they have the

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established standards compatible with the AEC and so on so that you can have a good state program in that area.

Now, we believe that the proper thing to do then would be to see whether or not the Act should be amended to permit the states to participate in this manner.

Now, there are more complications, I would hasten to add, between the state regulation on effluents and the AEC regulation on the safety of nuclear power plants including effluents so there may have to be a further transitional period and one of the things we are working on now is to enter into somewhat we call pilot agreements with the states by contract so that the AEC and the states can monitor the radioactive effluents from nuclear power plants.

We have entered into such an agreement with the State of Pennsylvania. We are working with the State of Maryland and the State of New York and would be expecting to enter into agreements with other states.

There is the kind of thing that other states are interested in and concerned about, so they can have some independent estimate of what the degree of effluence from power plants are.

Now, to point out the problems and the difficulty of dual regulation, under the Commission's regulations that Chairman Seaborg mentioned that we have put into effect

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that requires a utility on a nuclear power plant to hold the radioactive effluents as low as practicable, under this formalization of a practice that the Commission had engaged in for many years, the Commission, through Mr. Price's organizationreviews the design of each plant to see that the levels of radioactivity, these incidental effluents that are mentioned here that would amount to no more than five millirems at a boundary, and which are only a very few percent of this established standard, the Commission has been and will be reviewing these levels and we have been working now to see whether or not we can provide guidance to the utility applicant, to the equipment company that builds the plant on ranges which they will design these plants to stay within.

Then, as I mentioned, the Commission and the utility and hopefully the states will participate, will be monitoring these plants to make sure these effluents are at these very low levels.

Well, there can be some question raised then: What would the state be doing if it set a level different from what this very low one that would be established for each plant under the Commission's regulations?

So we believe, however, and we are willing in good faith to explore this with the states and with the Congress, on whether or not Section 274 of the 1959

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amendments should be further amended to permit this.

In that sort of framework, then, it would be somewhat similar to in the field of water pollution or the thermal effects, whereby Mr. Ruckelshaus' agency approves state levels for thermal effects, and that the federal government still plays a fairly large role.

Now, we believe the safety -- looking at the safety of nuclear power plants in relation to the effluents is a somewhat more complicated kind of thing than just looking at levels of thermal effects, so whether or not this is something that the Commission, the Administration and the Congress will finally come to the view that the Act ought to be amended that way is something we will have to see about, but it's something we believe should be explored and to see sort of what the pros and cons are.

In the meantime, as I pointed out, and as the Chairman pointed out, these levels are so low as to almost not be able to be detected through monitoring and that there isn't any great problem while we are working out such arrangements.

end 4

QUESTION: Dr. Seaborg, I wonder if you could comment? It seems that all these problems concerned with regulation by the state and Federal Government seem to be placing the nuclear industry in a place where they might not be able to compete with onventional power sources.

Is this a great danger with these environmental considerations?

CHAIRMAN SEABORG: I don't think so. I think they have -- the nuclear industry has a cost advantage and I think that is becoming apparent now as the cost for the fossil fuels are going up. They have gone up dramatically within just the last year and the indications are that they will go up further; whereas, the cost for nuclear fuel itself is, while going up, ~~is~~ only a very small percentage of the cost of the fossil fuels.

QUESTION: What are the prospects for the applicati of nuclear energy to space propulsion? In your statement you say that the reusable nuclear flight engine, is this to become the space vehicle of the future? How remote do you think that future is?

CHAIRMAN SEABORG: Well, we believe that depending on the priority of funding, that we could have a nuclear flight engine ready by the early 80s, something of that sort. It is that kind of timescale.

COMMANDER RANEY: We have had a very successful

development phase of the nuclear rocket engines where we have gone through the technology phase and now are engaged in preparing for ground development of a flight-rated engine.

QUESTION: Dr. Seaborg, were you disappointed in the decision of the Panama Canal Commission to not use nuclear cratering devices to help build the canal, and as a corollary to that, where do you think this leaves this technology at the moment?

CHAIRMAN SEABORG: Yes, I would say I was disappointed, but I didn't regard it as an unreasonable decision. It was based on the fact that the technology hadn't advanced to the point where they could recommend its use at this time and their report was due by the end of 1970.

They didn't rule out, by any means, the possibility of nuclear means being used when and if sometime in the future the excavation technology will be developed to a point that would make its~~elf~~ feasible.

The second part of your question, where will it go -- I think that it will be used. I hesitate to try to -- I am talking about excavation technology now -- I hesitate to try to estimate a timescale but it does ~~over~~ offer advantages which I think will become apparent in many sections of the world as time goes on.

QUESTION: Mr. Chairman, would you comment on the state of the Soviet effort in the Tokamak machine and as a

corollary to that, would you comment on our own efforts to build such a device?

CHAIRMAN SEABORG: Yes. The Soviets, in developing the Tokamak approach, have made a step forward -- this is a controlled thermonuclear reaction -- have made a step forward that in the eyes of many -- not all -- but in the eyes of many is perhaps the greatest that has been made by any nation in the last couple of years.

I should say that due to our program of close cooperation with the Soviets, we have the full benefit of that step forward and some of our labs have modified their program to include the Tokamak approach. I think this is a very good example of international cooperation and how it has led to greater progress by many nations and the saving of money.

I say many nations. There are other nations besides the United States and the Soviet Union, including England and France, that are working in controlled thermonuclear reactions as well. Where controlled thermonuclear reactions stand is a very difficult assessment to make.

As I have indicated, a good deal of progress has been made over the years. It is a very difficult technology. Specifically, we understand the principles, but the actual building of the machines involves the solving of some very difficult problems. We have not yet succeeded in producing

a sustained thermonuclear reaction, a sustained ~~fission~~ reaction that produces more energy than it consumes in the act of producing that sustained reaction. We know the conditions of temperature and ion concentration in the plasma and containment time that would lead to such a sustained reaction.

Some of our scientists think that we are within a few years of reaching that point. Some scientists say when we reach that point we will have reached the same point as fission reached when Fermi had his successful first ~~yield~~ fission reaction in the West ~~End~~ Stands at the University of Chicago, September 2, 1942. You know how much longer it took after that to have economical nuclear fission power.

It might take a time comparable to that before we would have economical ~~yield~~ ~~fission~~ fusion power.

End #5 QUESTION: Thank you.

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