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MINUTES

Thirty-ninth Meeting of the General Advisory Committee to the U.S. Atomic Energy Commission

March 31, April 1 and 2, 1954
Washington, D.C.

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FIRST SESSION
(March 31, 1954)

The Committee met in executive session at 9:30 a.m. All members, the Secretary, and Mr. Tomei were present.

The Chairman drew attention to the schedule (Appendix A) and agenda for the meeting.

Schedule

[redacted] DOE 6.1(a) These results could be expected to have a tremendous impact, both technically and economically, on the Commission's program. [redacted] DOE 6.1(a)

Nevada Proving Grounds

The GAC had been asked to consider the report of a Committee to Study the Nevada Proving Grounds. The report recommended certain specific limitations on the size and number of shots which could be fired there. Dr. Rabi had already referred Mr. Nichols to the Committee's statement of February 10, 1953 on the importance of the test programs and the need to increase our weapon testing capabilities.

The Remote Defensive Air Battle

Dr. Rabi said that, according to Rand's early report on the Gabriel project, fall-out was expected to be particularly troublesome with the smaller weapons. This led to a discussion of the possible use of large numbers of small bombs for air defense, and the fall-out hazards which this would entail. Dr. Fisk said that the defensive battle should be fought many miles from populous centers (200-500 miles), and repeatedly emphasized the importance of this concept of the remote air battle. There was some discussion of the need for evaluating this concept, and it was suggested that the Committee recommend that a study be made on the

anti-aircraft use of atomic weapons and the fall-out effects to be anticipated. This study might be made by Rand, or preferably by the DOD jointly with the AEC. It was agreed that such a study would be desirable but that further discussion should precede any recommendation by the GAC on the matter.

Interest was expressed in the prospects for defensive measures against submarine-launched atomic weapons. A two hundred-mile missile might be expected. The problem was to detect the submarine; there are promising developments in detection methods. It is very difficult to detect the missile, and we do not now know how to defend against inter-continental rockets. In any case the possibilities of atomic weapons in defense against airplanes should be thoroughly explored.

BNL Entirely Unclassified?

The Commission had asked the GAC to comment on a suggestion that the Brookhaven National Laboratory be devoted entirely to unclassified research, in order to provide a suitable location where uncleared foreigners could participate in the research program. Dr. Rabi said it was his impression that present restrictions on alien participation in unclassified research stemmed more from fear of adverse public relations than from genuine security considerations.

The Committee felt that the suggestion about BNL was in general not a good idea. It would be a real loss to the AEC not to have the classified investigations now in progress there and not to be able to call on BNL for help on other classified problems in the future. Also the move would tend to isolate the Laboratory from the Commission's program, could have the effect of weakening the Laboratory's position, and might cause discontent within BNL or in other of the Commission's laboratories.

PWR Costs

A paper on PWR characteristics was considered. It was particularly noted that the estimated operating cost (3000 hr core) was 61.9 mils/kwh, of which 39.7 mils/kwh was for reactor core fabrication. At least one member of the Committee felt that the Committee should register a protest on these costs.

[redacted]

Dr. Fisk said that the military seriousness of such an occasional reduction in yield could be evaluated only

through an inclusive analysis of the entire weapon use operation. To base a production program on the nebulous argument given as to military acceptability would be quite wrong.

Dr. Rabi inquired from Dr. von Neumann as to the adequacy of the theory of preinitiation. The latter replied that it stands intermediate between the theory of criticality, which is in very good shape, and the theory of yield. The theory of yield is good only to about a factor of two without empirical corrections based on data from the shots which have been fired; with these corrections it gives accurate results. Dr. Rabi said that it is the early stages of neutron multiplication which are not well understood; these are crucial in the preinitiation problem. He also said that a good theory of the thermonuclear weapon is not available either, and furthermore that it is not well established what would be the difference in weapon effects between, for example, 3 megatons and 9 megatons.

The summary of Dr. Froman's letter in AEC 374/8 stated, in part, that there is no significant evidence from tests that preinitiation theory is incorrect and that there is a very good basis for believing the predictions of preinitiation probability. Dr. Froman's analysis gave the result that in thirty three tests the calculated probability that preinitiation would have escaped detection (as it did) is 0.42. The Secretary pointed out that while this result shows that the shot results are consistent with preinitiation theory, they cannot be taken as quantitative confirmation of theory. For example, the fact that no preinitiation was observed is "even more consistent" with zero probability of preinitiation in each of the 33 shots.

Dr. Libby raised a question whether Los Alamos should be criticized for being too conservative. He felt that its development program has been dominated by theoretical physicists, and that bolder experimentation would be in order. [redacted] He also remarked on the quality of boldness in the Livermore approach, and said that if their experiments were successful they would continue to be bold, if unsuccessful no one would dare to be quite so bold.

Meeting with the Commissioners and General Manager

At 11:30 a.m. the Committee met with Dr. Smyth, Mr. Murray, Mr. Zuckert, and Mr. Nichols. Mr. Strauss arrived later. Mr. Tomei was excused from the meeting.

BNL Entirely Unclassified?

Dr. Rabi asked whether the suggestion that Brookhaven be devoted entirely to unclassified research was a serious one, and expressed the rather unfavorable initial reaction of the Committee. Dr. Smyth replied that he had made the suggestion for discussion, to explore whether this might be a way to handle the difficult problem of foreign participation. He rephrased the question: if one were faced with the alternatives of this step or of excluding all foreigners, which would be preferable? Dr. Rabi said that the reaction of the Laboratory should certainly be ascertained and considered before a judgment was expressed. Dr. Smyth indicated that the matter need not be further considered at present, but might come up again.

Policy on Aliens

Dr. Rabi next acknowledged receipt of the policy paper on aliens, AEC 89/3. He mentioned that there had been considerable difficulty at

Brookhaven because of long delays in AEC action on the Laboratory's requests for approval to appoint foreign scientists (in most cases without compensation).

Boiling Water Reactor

Mr. Nichols said that item h in the premeeting letter suggesting that the GAC make a technical evaluation of the proposed boiling water reactor project was a matter which the Reactor Subcommittee might consider.

Castle Fall-out

At this point Mr. Strauss entered. He first mentioned the increasing tendency of industry to participate in the reactor program and indicated that the Commission proposed to encourage this participation. He next turned to the subject of the two Castle test shots, and expressed concern about the adverse publicity resulting from the fall-out difficulties. The Japanese fishermen were a problem; U.S. representatives have not been allowed to see them or inspect their boat.

Mr. Strauss mentioned that the British had granted us basing facilities for monitoring the Woomera tests, and had asked us for corresponding facilities at Castle. Their request had been granted, and there was a British intelligence team at Kwajalein.

Dr. Rabi asked whether there was anything for the GAC to consider in connection with the President's UN proposals. Mr. Strauss replied that he hoped for suggestions on how to enlist the support of American and also foreign scientists.

This session was adjourned at 12:40 p.m.

SECOND SESSION
(March 31, 1954)

The Committee met in executive session at 1:40 p.m. All members, the Secretary, and Mr. Tomei were present.

Party

Dr. Rabi explained that it had been found desirable to postpone the GAC's party for the Commissioners and senior AEC staff. It would be appropriate to hold it at the time of the next meeting.

Dates of Next Meeting

The dates of the next meeting were fixed as May 27, 28, and 29, 1954; and it was decided to hold the party on Friday evening, May 28. It was noted that Dr. Libby and the Secretary could not be present at the next meeting.

Research Matters

At 1:55 p.m. Dr. T. H. Johnson and Dr. Smyth met with the Committee.

Budget

Dr. Johnson first reported on the situation of the Research Division's budget. The January budget submission had requested $42 million for FY55; this had been cut by the House Appropriations Committee to $38.9 million. The House Committee's report used the following language: "The Committee does not intend to hamper any productive research project as research is one of the most important facets of the atomic energy program. There are, however, always fringe items which research scientists would like to investigate which have a comparatively slight possibility of producing useful results. This is the type of project that should be eliminated in order to accomplish the budget objective."

Although this year's budget is also $38.9 million, the actual present rate of expenditure corresponds to $40.8 million per year. Hence the $38.9 million figure for FY55 would necessitate a reduction of the

present level of research effort. The net reduction would be increased still further due to the effect of the new large facilities such as the bevatron and other accelerators and the ANL research reactor, whose operating expenses must be provided.

It was not yet known exactly where the cut would be applied, however, its effect would certainly be serious. Dr. Johnson noted that Navy longevity funds are now being used in financing the AEC-ONR Joint Program. He also mentioned that it was considered urgent to initiate new projects in corrosion research and in chemistry bearing on the separation of the plutonium isotopes; hence the cut would be felt in other work now going on.

ONR-AEC Joint Program

This situation was deplored. It was felt that the GAC could be of assistance if it provided a brief but strong statement urging restoration of the research budget, which could be used in the Senate budget hearing for April 7. (Such a statement was phrased later in the meeting.) There was considerable discussion of the unfortunate language of the House report referring to "fringe" projects. Dr. Johnson and Dr. Smyth indicated that they proposed to deny that the Commission's basic research had this character. Mr. Murphree, however, cautioned that this would be an awkward position to take. He felt it would be better to defend the research program as carefully considered and well balanced and to maintain the essentiality of research of a so-called "fringe" character because of the unforeseeable useful developments which may come out of such research. Dr. Buckley said that fundamental research should not go down while the total effort goes up; it is good practice to maintain a rough proportion between research and the total effort. Several favored the use of specific examples of tangible developments from basic research. Dr. Warner and

others said that a strong point should be made about the fact that additional facilities require additional operating funds for their utilization.

With regard to the GAC's recommendations on administrative policy in the research laboratories, Dr. Johnson said he had circulated an edited version to the laboratories and field offices for comment. He would report on the replies at the next GAC meeting.

GAC Recommendations on Research Laboratories Policy

Dr. Johnson said that the midwestern interest in a very high energy accelerator is increasing. Dr. Zinn has been told that if the AEC were to request funds for a midwest accelerator, the accelerator would be located at Argonne; also, Dr. Zinn has not been authorized to proceed with a project for the design of such an accelerator until it becomes clearer that actual construction can go ahead.

Accelerators, ANL-University Relations

The authorization of ANL funds for study of the accelerator project has been suspended. This was thought to be desirable pending a better evaluation of ultimate costs and how they might be met. The step was also taken to avoid implications that the AEC was committing itself to construct the machine. Dr. Libby questioned this step. He felt it to be vital for the future of the Argonne that the schism between it and the universities be healed. With this premise he developed the thesis that funds should be kept available to permit stepwise development of collaboration and cooperation between ANL and the universities. The joint accelerator study would be an important step in this direction. Dr. Warner spoke to the same subject, in general agreeing with Dr. Libby. Dr. Smyth expressed interest in the stepwise approach to the problem of Argonne-university relations, and indicated that he would review the study fund question in this light with the other Commissioners and the General Manager.

Dr. Johnson, continuing his report, said that the long delayed executive order on research had been released on March 17 by the White House. Its language was generally satisfactory to the AEC. The National Science Foundation was to be encouraged to increase its level of operations; and other agencies were to be encouraged to support researches allied to their particular interests.

Executive Order on Research

The next subject was foreign travel. Dr. Johnson said the flood of requests this year posed the question of what the policy should be. Present practice is to allow up to one foreign trip per year from each major division of the laboratories, or per million dollars in off-site research contracts. Dr. Johnson proposed to endorse requests (each ultimately requires the General Manager's approval) on the basis of profit to the research program but not on the basis of promoting good will, or of rewarding distinguished scientists, etc. He favored paying all the expenses or none. Some others present did not see why it was necessary to be so rigid in the reimbursement aspect of the travel policy, and felt that provision to pay part of the expenses would have many advantages. The matter was not discussed further.

Foreign Travel

Dr. Johnson next reviewed progress in the controlled thermonuclear reaction program. The main technical development had been at Livermore. The magnetic mirror had been excited and protons injected. The lifetime of the plasma, 3 milliseconds, indicated there were no serious plasma oscillations. No neutrons have been observed yet. The situation is hopeful. The duty cycle will be increased. At Princeton, Spitzer's machine had been almost completed. A discharge had been achieved in the flexible stainless steel tube.

Controlled Thermonuclear Reactions

Dr. Rabi asked if any action had been taken to set up a group for theoretical studies in magneto-hydrodynamics. Dr. Johnson said that there was a research contract at NYU which would involve use of the computing facilities.

At 3:05 p.m. Dr. Smyth left the meeting.

BNL Entirely Unclassified?

Commenting on the proposal to make Brookhaven entirely unclassified, Dr. Johnson said he had a staff paper which recommended against it.

Research Reactors

The last item brought up by Dr. Johnson was research reactors. The proposed installation at Penn State has been authorized, and authorization papers are being prepared for one at the University of Michigan. Because of a reservation of the Reactor Safeguard Committee about the possibility of reaction between water and aluminum, he was recommending that the fuel elements in these reactors use stainless steel jacketing.

Assistant General Manager for Research and Development

Dr. Rabi asked how the appointment of Mr. Tammaro as Assistant General Manager for Research and Development would affect the operations of the Research Division, Brookhaven, etc. Dr. Johnson indicated that BNL would continue to report to the New York Operations Office, which would report to Mr. Tammaro instead of to the Division of Production as formerly. There would now be a person, Mr. Tammaro, who could look at BNL as a whole.

At 3:25 p.m. Dr. Johnson left.

Weapon Matters

At 3:30 p.m. the Committee met with Col. V. G. Huston, Col. E. T. Dorsey, Cdr. G. J. Anderson, Dr. P. C. Fine, Dr. Darol Froman, Dr. W. D. Claus, Dr. C. L. Dunham, and Mr. Murray to discuss the Nevada Proving Grounds. All members of the Committee, the Secretary, and Mr. Tomei were present.

Col. Huston reviewed the report and recommendations of the NPG Committee. The recommendations included:

Nevada Proving Grounds

(1) restriction of the number of nuclear shots in any 12-month period to a planning maximum of 10 to 15;

(2) each shot to be justified individually as to technical necessity and probable off-site hazard;

(3) shot sizes to be less than 1 KT for surface or subsurface, 25 KT for 300-foot tower; 50 KT for 500-foot tower, 80 KT for airdrop (fireball not to touch the ground).

Dr. Claus quoted from a letter from the Biology and Medicine Advisory Committee to Mr. Murray which recommended a planned maximum of 10 shots in any 12-month period.

Mr. Murray expressed the strong belief that the NPG should continue to be used. He felt it important that no indication of hesitation be given; any such indication would endanger the continued use of the site.

The Committee considered the recommendations about the NPG to be sound with the exception of the 10-shot limitation. There seemed no rational basis for selecting this as the maximum number. Dr. von Neumann felt it would be best not to prescribe a limiting number, but rather to consider each proposed shot per se.

At 4:10 p.m. the visitors left except for Dr. Froman, Mr. Murray, Dr. Claus and Dr. Dunham.

Castle Tests

[redacted]

DOE 6.1(a)

[redacted]

DOE 6.1a

DOE 6.1a

DOE 6.1a

At 4:30 p.m. Dr. Froman and Mr. Murray left the meeting. [redacted]

DOE 6.1a

With the aid of a map Dr. Claus described the region in which heavy fall-out was known to have occurred. There was a very narrow band of very high fall-out. At Rongelap atoll, 110 miles from the shot, the density of fall-out ranged from about 5 to 61 megacuries per square mile in a strip about twenty miles wide. The drinking water was heavily contaminated. By the third day its activity had decreased to the

Castle Fall-out

permissible emergency level of 11,000 disintegrations per minute per cubic centimeter.

[redacted]

DOE 6.1(c)

At 4:45 p.m. Dr. Smyth joined the meeting.

Dr. Dunham reported on the radiation exposures from the medical point of view. The natives in the Rongelap group received about 150 r. They described the fall-out as a fine sand or fluffy powder, beginning at H + 12 hr. They were evacuated at H + 51 hr. They felt fine for two weeks after exposure; then various symptoms (burns, loss of hair, depigmentation) began to develop. They would probably recover satisfactorily.

Some of the exposed Japanese fishermen were in critical condition according to the most recent reports of their blood pictures. If the reports were correct, some fatalities might be anticipated.

At 5:15 p.m. Dr. Dunham, Dr. Claus, and Dr. Smyth left the meeting.

In the remainder of this session, various comments were exchanged on: what the GAC should say about the Nevada Proving Ground question; preinitiation; boldness or the lack of it at Los Alamos; etc.

At 5:45 p.m. this session was adjourned.

THIRD SESSION
(April 1, 1954)

The meeting was called to order at 9:30 a.m. All members of the Committee, the Secretary, and Mr. Tomei were present.

Weapon Matters

[redacted] DOE 2.11

After the showing of the movie, the visitors present were Dr. Froman, Dr. Carson Mark, Col. Huston, Dr. Fine, Mr. Murray, Dr. Smyth, and Col. Dorsey.

[redacted] DOE 2.11a

Castle Tests

[redacted] Some of the points brought out were as follows.

[redacted] DOE 2.11

Corrections favorable to higher yield are probably necessary in several features of the calculations, namely with respect to:

the equation of state of Li-D;

the amount and particle size of uranium mixed with the Li-D;

the fission cross sections of U-237 and U-239;

nuclear reactions not in the calculated sequence of lithium-hydrogen reactions, e.g. Li^7-T, 2n.

There are plans to measure the fission cross section of U-237 in the intermediate neutron flux of the KAPL reactor. Los Alamos intends to check the equation of state of Li-D with standard implosion techniques.

[redacted]

DOE 6.1(a)

[redacted]

DOE 6.1(a)

Attention was next given to the effects of preinitiation in the primary bomb.

Pre-initiation

[redacted]

DOE 6.1(a)

Dr. von Neumann asked whether one could design the primary bomb for 90 kilotons and accept yields in the range 60-90. Dr. Mark said this would probably be all right. [redacted] A similar bomb could be designed for 30 kilotons with only a 2% probability of preinitiation.

Dr. Rabi asked how could data be obtained, soon, to decide how close the design is to the ragged edge, i.e. where one is on the yield-compression curve and what the slope is. The question remained open. Dr. Libby suggested a shot with a 30-kiloton primary.

[redacted]

[redacted] DOE (a)

After some further discussion in which Dr. Libby again voiced his caveat against barge shots, this part of the session was concluded.

Production Matters

At 11:35 a.m. Dr. Frank Pittman met with the Committee to discuss production requirements, and the effect of the test results on these requirements. All members of the Committee, the Secretary and Mr. Tomei were present. Dr. Mark, Dr. Froman, and Dr. Fine also remained.

Tritium

Dr. Pittman reported that the new requirement for tritium was, at most, half of the previous requirement. Hence it will not be necessary to enrich all of the Savannah River reactors, or as many at Hanford as planned. Another 30-40% reduction in the requirement would make it unnecessary to use any enriched loadings at Savannah River. Dr. Pittman also said that if no tritium were required for thermonuclear weapons, some enrichment would be required at Savannah River up to 1956, but none thereafter.

Plutonium g/T vs n/g-sec

Dr. Pittman mentioned a probable change in the manner of specifying plutonium quality. It was proposed to state the specification in terms of the number of neutrons emitted per gram per second rather than in terms of g/T (grams of plutonium per ton of uranium). The definition of high quality plutonium would be 20 n/g-sec rather than 200 g/T.

Balanced Plutonium Schedule

It was planned to fulfil the plutonium requirements by a balanced production schedule at two levels, 20 n/g-sec for high quality material, and 80 n/g-sec for standard material. The latter level corresponds to

a substantially higher g/T level than the present standard production; and the acceptance of this level will make it possible to produce the high quality material in addition without too much trouble. It will not be necessary to undertake new process plant construction beyond that now planned. The requirement for high quality material will not be met in 1955, and probably not in 1956, but will be in 1957.

There was some consideration of whether still higher quality plutonium would be needed, as suggested in Dr. Bradbury's letter. Dr. Mark summarized the situation by saying that material of better than 200 g/T quality was not needed for present designs, but that its lack would place a limitation on future design possibilities.

U-233

Dr. Pittman reviewed the U-233 situation. According to a recent study, the cost of U-233 would be comparable to that of 20 n/g-sec plutonium. It was planned to commence some production by loading an enriched Savannah River reactor with thorium next year. There is some indication that the supply of thorium metal will be a bottleneck. For a separation plant, a Savannah River Purex plant will probably be converted to the Thorex process.

Plutonium Isotope Separation

Upgrading plutonium by isotope separation did not appear economically advantageous, under any conditions, in comparison to U-233. (Dr. Pittman referred the Committee to an Operations Analysis report by Mr. Herron, which compared low g/T, isotope separation, and U-233. However, the report was not available during the meeting.)

Li-6

The lithium-6 production plans had not been altered, and the plan to construct a second plant was going along. The capacity for converting LiOH to LiD might be a bottleneck.

At 12:35 p.m. this session was adjourned.

FOURTH SESSION
(April 1, 1954)

The Committee met at 1:45 p.m. All members were present, except Dr. Libby who arrived during the session. The Secretary was present. Mr. Tomei entered during the session.

Dr. Reichardt met with the Committee at this time to report on intelligence matters.

Intelligence Matters

The Norsk-Hydro electrolysis plant has purchased 800 kg of 1% platinum on granular charcoal. It is apparently their intention to augment their heavy water production by catalytic exchange methods. Their present capacity, 15 tons D_2O/year, can probably be doubled.

A Soviet lieutenant who defected in Austria has furnished information about top secret Soviet atomic energy defense training manuals. The statements as to weapon effects of 5, 20, and 100 kiloton bombs are not entirely consistent with U.S. data. Two manuals which the informant knew of but had not seen may have been tactical manuals, the implication being that the Russians have offensive tactical atomic weapons. The credibility of the informant is not established beyond question.

Information was received during 1946-1950 about two groups of German scientists at Sukhumi, in the Caspian Sea area. They worked on nickel barriers, both impregnated mesh and seamless tubes, and studied gaseous diffusion. Research on an ultracentrifuge, on a high current ion source (comparable to those used at Y-12), and on a process control type mass spectrometer was also reported. These activities are taken as indication

of Soviet research interest in the separation of the uranium isotopes. The mesh research would seem to confirm the British interpretation of the use of the nickel mesh which was acquired by the USSR in large amounts. There are also reports of a bomb debris detecting station located in the Caspian area. [redacted] DOE Guide

Dr. Reichardt left at 2:10 p.m., and the meeting continued in executive session.

BNL Entirely Unclassified?

The Committee returned briefly to the question whether Brookhaven should be devoted entirely to unclassified work. It was agreed that there was no basis for a formal comment by the GAC at this time. It was generally felt that the suggested move was undesirable, both from the Commission's point of view and from that of the Laboratory. If the question were to be considered further, the Committee would like to have a document, e.g. staff paper, in which the proposal was analyzed. Knowledge of the attitude of the Laboratory would be an important element in any further considerations.

At 2:15 p.m. Dr. Libby returned.

Nevada Proving Grounds

The next subject considered was the use of the Nevada Proving Grounds. All agreed that the continued use of the proving ground was essential to the weapon program. Continuation of the test program was imperative, otherwise progress would be stopped in important lines of weapon development. The recommendations of the NPG Committee were felt to be sound in general, but with the specific exception of the one which recommended limitation of the number of shots in any 12-month period to

10-15. (The discussion focussed on the number 10, since this seemed to be the limitation that the Commission was actually considering.) The Committee could see no technical or safety reasons for fixing on the number 10. A better policy would be to shoot whatever number are necessary and practical, appropriate precautions being taken for each shot. (Appendix B)

Pre-initiation, etc.

The Committee next considered the linked subjects of preinitiation, plutonium quality, and production of materials. Dr. Rabi expressed pleasure that the problem of producing 20 n/g-sec ("200 g/T") plutonium now seemed less formidable. However, the need for material of this quality had not been demonstrated. Dr. von Neumann pointed out that some quantities of high grade material would continue to be needed as long as there were new weapon designs to be tested, in order to eliminate plutonium quality as a factor in the test results. (He referred here to tests necessary in the development of new designs rather than to proof firings.) (Appendix C, item 2)

Pre-initiation Test

Greater knowledge and understanding is required on two technical problems: (1) what is the effect on the thermonuclear yield of a reduced (or variable) yield of the primary bomb; and, (2) quantitatively, what is the preinitiation behavior of the primary bomb. At the Chairman's request, Dr. von Neumann agreed to look into the present theory of preinitiation to see if it is being done as well as can be. The Committee agreed to reiterate its suggestion that a preinitiation test be carried out to check the theory under conditions remote from those of maximum yield.

The feeling was expressed that Dr. Bradbury should re-write his letter of January 18, 1954, to Gen. Fields, in the light of subsequent experience. Dr. Fisk, in particular, emphasized that the statement regarding DOD acceptance of given preinitiation probability should be reviewed. It was also felt that test results should be thoroughly considered before any production steps more drastic than the program described by Dr. Pittman were undertaken. (Appendix C, item 2)

There was no expression of opinion that the Li-6 program should be cut back. [redacted] Dr. Rabi suggested that the Committee return to these questions at its next meeting.

Mr. Whitman reported on his visits to Oak Ridge and Savannah River.

Reactor Matters

In general, his impression was excellent. The problems involved in the production changes were being ably handled. Many of his fears on the

Homogeneous Reactor

homogeneous reactor project had been allayed, and he thought the corrosion problem would be solved. It was felt at Oak Ridge that the homogeneous reactor would be the answer to any need for large amounts of low n/g-sec plutonium.

The reactors at Savannah River looked good, although two problems

Savannah River Reactors

were bothersome at the moment: (1) The reactors were "nervous", experiencing frequent shut-downs due to the abundant and active safety controls. (2) There were worries about the safety aspects of enriched loadings.

However, enrichment now appears unnecessary as far as tritium is concerned; and the problems may have been solved by the time enriched loading is used to make U-233. Dr. Wigner observed that the U-233 program was not very well settled yet, but that in any case thorium makes for a little better stability because of the temperature coefficient of the resonance capture.

Mr. Whitman mentioned the zero power pile and the production type pile built specifically for development work at Savannah River. He had felt it was a good idea to have these reactors, but had not studied the matter closely.

At 2:50 p.m. Dr. von Neumann left the meeting.

Boiling Water Reactor

With regard to the question on the boiling water reactor in the pre-meeting letter, Mr. Whitman said that this would be considered in a meeting of the Reactor Subcommittee later in the day.

Research on Isotope Separation

Mr. Whitman mentioned his impression that the K-25 group would like to be asked by the Commission to increase the scope of its research on methods of isotope separation. This was discussed to some extent. The Committee seemed to feel that isotope separation research should be encouraged in general, Dr. Libby being the most strongly outspoken proponent of this view. (Appendix C, item 3c)

Policy on Aliens

The Chairman next brought up the subject of AEC policy on research by foreigners at BNL and UCRL. This had originally been an agenda item for discussion by the General Manager; however, it had been learned that the Commission had reformulated its policy on this subject and a copy of a paper (AEC 89/3) was available. He read portions of this document.

Dr. Rabi went on to say that the policy as expressed seemed satisfactory, but that the applications of the policy had left something to be desired. He then quoted from a letter which Dr. Goudsmit of BNL had written to express his personal view on the situation. In this letter Dr. Goudsmit referred to the great benefits, to the laboratories and to the AEC, of having foreigners participate in the unclassified research programs; and he drew attention to difficulties which had been experienced in making arrangements with the AEC for such participation. The difficulties were in the nature of refusals in some cases, but were predominantly that the AEC delayed its answers to requests for approval for very extended periods of time. Dr. Rabi had given a copy of the letter to the General Manager. Brookhaven had had a number of requests pending for months for permission for aliens to engage in unclassified work (in most cases without compensation, and on a temporary basis). No word at all had been received. Dr. Wigner said that requests should certainly not go unanswered for six months, and he felt the GAC should go on record to that effect. (Appendix C, item 3d)

GAC Statement on Research Budget

The next subject considered was the House cut in the FY55 budget of the Research Division. Dr. Warner had prepared a statement on this subject, which was read to the Committee. This statement was adopted by the Committee as an expression of its position. After some slight subsequent modifications, the statement read as follows.

"The GAC is seriously concerned over the disadvantage to the AEC program of the prospective cut in the budget requested by the Commission for support of basic research.

It is our belief that the experience of industry is pertinent -- that as total scale of operation is increased and made more diversified, more money must be spent on research to insure continued progress. The overall scale of operation of the AEC has been increased; the diversity of operations has been increased; and important new research facilities, requiring substantial budgets for their full use, have been furnished. We urge the Commission to make every effort to have the research budget fully restored."

(Secretary's Note: Two copies of the statement were transmitted to the General Manager on April 2, 1954, for his use in attempts to get the budget restored.) (Appendix C, item 3a)

The Committee had considered whether it should prepare a more elaborate statement containing quantitative research budget comparisons with industry and also justifications of "fringe", basic research by specific examples. It decided not to do so at this time.

ONR-AEC Joint Program

The Committee felt that a specific comment should be addressed to the Commission on the subject of the ONR-AEC Joint Program. The attrition of the longevity funds, which were now being used by the Navy to keep the program going, was considered very unfortunate. A previously expressed sentiment to the effect that it would be more worthwhile for the AEC to support this program than the construction of new linear accelerators for heavy ions was reiterated (Dr. Libby and Dr. Wigner). It was agreed to make a statement of regret that the GAC saw no plans on the part of the AEC

to do its part in maintaining the level of this important program. (Appendix C, item 3b)

Barge Shots

[redacted] His belief was that, in contrast to shots in which a large mass of coral was blown up and could scavenge the debris cloud through near-by fall-out, the water blown up in a raft shot might not act to scavenge the cloud. Hence, there might be a much greater danger of distant contamination in the case of barge shots. Dr. Rabi attacked this thesis as implausible and unproved; and a vigorous argument developed. Since sufficient data were not available, the disagreement remained unresolved. Some doubt was expressed, however, that scavenging by coral could remove more than a small fraction of the radioactive debris.

Mr. Tomei was excused from the meeting at 3:45 p.m.

Dr. Rabi told the Committee about the letter which he had written to Mr. Strauss on February 23, 1954, and read a copy of the letter. He also reviewed subsequent events bearing on the subject of the letter.

At 3:55 p.m. Dr. von Neumann returned.

In connection with Mr. Strauss's interest in enlisting scientists behind the UN's proposal, Dr. Rabi mentioned a suggestion which he had made to Mr. Strauss along this line. The suggestion was to hold an unclassified international scientific meeting on atomic energy, the meeting to be held under the auspices of the National Science Foundation or the National Academy of Sciences. The location would perhaps be outside the

International Meeting

country. If properly handled, the conference could have strong propaganda value.

GAC Recommendations on Research Laboratories Policy

The status of the GAC's recommendations relative to administrative policy in the Commission's research laboratories was considered. Dr. Libby pointed out that no mechanism seemed to exist for implementing them. He suggested that Mr. Nichols be asked whether Mr. Tammaro would be in a position to consider carrying them out. This was discussed at some length, particularly in connection with speculations about the functions of the new post of Assistant General Manager for Research. It was decided not to raise the question with the Commission at this time. Dr. Rabi suggested that it might be a good idea to have Mr. Tammaro in at the next meeting of the Committee.

Assistant General Manager for Research and Development

Dr. Libby on Medical and Industrial Uses of Radioactive Isotopes

The Chairman next offered the floor to Dr. Libby for a presentation of his ideas about medical and industrial uses of isotopes, which he had been wishing to bring before the Committee for the last several meetings. Dr. Libby responded. He said that there were very important possibilities for uses of radioactive isotopes far beyond their current applications.

On the medical side, he said, the possibilities of clinical uses for diagnostic tests (on healthy people as well as sick ones) are largely unexplored. He believed this to be potentially an enormous field. It would be cheap and non-hazardous. The most important isotopes would be those of hydrogen and carbon. Unfortunately he had been unable to elicit very much interest from the medical profession. The reasons seemed to be: (1) that it had only recently been realized that such uses would be safe; and, (2) the lack of appropriate instruments for low level measurements.

He referred to the "isotope farm" which had been started five years ago at ANL to prepare biosynthetically the drugs that would be used. Many labelled compounds were now available, but the interest of the drug companies and physicians had been slight. Medical research with isotopes seemed to have been so strongly oriented toward the field of pathological ailments that the possibilities for these practical diagnostic applications had received little attention. However he felt physicians would be interested if someone would develop the instruments and techniques. (Dr. Libby mentioned that some degree of interest had been shown in the products of the isotope farm by Lilly, Abbott, and the American Tobacco Company, the latter for research purposes.)

Dr. Libby proposed that the Commission get behind this field of isotope applications and push it. The benefits might be comparable to those from atomic power. He suggested that Dr. Manov, of the Office of Industrial Development, be encouraged to catalyze interest in the field and to get companies to make instruments available.

There were various questions, particularly as to the reasons for thinking that clinical applications would have such widespread importance. As examples, Dr. Libby mentioned: the determination of blood volumes with tritium compounds (the results might differ, in a significant way, from those determined with sodium); the possible use of labelled sugar for the diagnosis of diabetes.

Dr. Wigner remarked that Dr. Libby's personal enthusiasm might be the best agent for kindling interest in the medical profession. Dr. Rabi said that the Commission might consider collaborating with the National Institutes of Health in order to develop the right kind of instruments.

On the industrial side, Dr. Libby went on to say, there are hundreds of unexploited possibilities for isotope labelling, e.g. in the petroleum industry, and in connection with the smog problem. The big bottleneck is the fact that the appropriate instruments (scintillation counters and Geiger counters of special design) are not available on the market.

Mr. Murphree and Dr. Buckley said that this situation will take care of itself in a normal way. Dr. Fisk observed that instrument manufacturers will respond better to the needs of users than to forced attempts to arouse their interest. He also remarked that industry needs more well trained radiochemists who can see the possibilities in isotope applications; and Mr. Murphree said that there were probably many helpful applications of isotopes in the oil industry which were not being made just because people were not accustomed to this technique.

The Committee did not attempt to decide at this time on an action to take with reference to Dr. Libby's proposals.

Minutes Approval, 38th Meeting

The Minutes of the 38th Meeting were considered. After some alterations of phrasing suggested by Dr. Wigner and by Mr. Murphree they were approved.

Sunshine Data

During the remainder of this session Dr. Libby presented some new data on the world-wide distribution of strontium-90. Stillborn Chicago and Utah babies analyzed about 0.15-0.2 units (one unit being 1/1000 of the tolerance ratio of Sr-90 to calcium). Stillborn babies from India were about 0.05. New England adults and teeth from adult Londoners were blank. Wisconsin cheeses had a level about ten times that of Chicago babies; European cheeses were a little lower. Wisconsin alfalfa was 5-20 units, Wisconsin calves 1-2 units. Other data were given.

At 5:00 p.m. this session was adjourned.

FIFTH SESSION
(April 2, 1954)

The Committee assembled at 9:30 a.m., but, since the Chairman had to be absent for a time, did not formally convene until he returned at 10:05 a.m. Gen. Fields and Dr. Fine also entered at this time. All members of the Committee except Dr. Libby were present. The Secretary and Mr. Tomei were present.

Castle Tests

[redacted]

He then commented on the test difficulties in connection with weather, scheduling, and the contamination of fixed installations.

Fall-out

[redacted] In a photograph taken about 10(?) minutes after the explosion heavy particles could be seen falling out of the dome from above the 40,000 ft level. They effectively enlarged the stem to a diameter of 50-75 miles. The first fall-out on Rongelap could not have been from the stem; the later, heavier deposition was due to the stem.

Conversation about the tests continued for a while. Gen. Fields indicated that he was convinced that these large weapons should not be

shot unless there was very good insurance of getting a lot out of the test. [redacted] DOE 6.1(a) He also informed Gen. Fields of the Committee's position on the preinitiation question, and that it would recommend a preinitiation test in Nevada. (Appendix C, item 2)

Mr. Tomei was excused from the meeting at this point. [redacted] Gen. Fields indicated that he felt the Li-6 question should be reexamined, after the test results were in and understood, before committing the remaining $100 million to the Li-6 production program. DOE 6.1(a)

At 10:35 a.m. Dr. Libby, Mr. Nichols and Dr. Smyth joined the meeting. Mr. Campbell and Mr. Zuckert, who had entered a few minutes previously, remained. All members of the Committee and the Secretary were present. Mr. Tomei was not present.

Meeting with the Commissioners and General Manager

Dr. Rabi reviewed the Committee's reactions to the various matters which had come before it at this meeting.

He first mentioned the proposal to have only unclassified research work at Brookhaven, and, in connection with this, the AEC's policy on aliens as stated in AEC 89/3. He referred to the difficulty of delays in AEC action on specific requests regarding aliens, and said that this was hard on the morale of laboratory management. Prompt negative action, if necessary, would be better than six-month delays. He asked if the policy expressed in AEC 89/3 had been promulgated to the laboratories; Mr. Nichols replied that a letter on the subject was going out to the field. (Appendix C, item 3d)

Policy on Aliens

Dr. Rabi next presented the GAC's position on the essentiality of the use of the Nevada Proving Grounds and its agreement with the recommendations of the NPG Committee, except for the 10-shot/12-month limit. Dr. Smyth and Mr. Zuckert commented on the growth of tension during a long series; and Mr. Zuckert said that from this standpoint even a 10-shot limit was too high. Dr. Fisk suggested that it might ease public relations if the Commission would stress the defensive as well as the retaliatory role which atomic weapons could play. The defense of the country would be a real selling point for public acceptance of the tests. Dr. Smyth was somewhat doubtful that arguments should be used which would put one in the position of bargaining with the public. Dr. Rabi said the tests were so important that it would be well to spend additional money to evacuate people from danger areas if that became necessary.

Nevada Proving Grounds

[redacted] DOE 6.1(c)

He also said that the Committee was gratified to learn from the discussion with Dr. Pittman that the need for 200 g/T plutonium could be met with the existing and projected separation plants, without loss of production. (Appendix C, item 1)

Dr. Rabi next reviewed the Committee's position on preinitiation and "200 g/T" plutonium, as earlier agreed on. He brought out the Committee's feeling that the statement in Dr. Bradbury's letter on this subject may have been premature and should be revised after the Castle tests are completed and the data reviewed.

Pre-initiation, Pu g/T

[redacted] DOE 5.1(c)

Research Budget, ONR-AEC Joint Program

Dr. Rabi next reported the Committee's comments on the cut in the Research Division's budget and on the ONR-AEC Joint Program. Mr. Nichols mentioned that there is money in the FY55 budget for the Joint Program, if it doesn't get cut out.

Mr. Zuckert made several comments on the problems involved in budgeting basic research. It is extremely difficult to show how much money is going into the direct research effort, e.g. in physics and chemistry as contrasted to how much is eaten up by fixed overhead costs. The present accounting system does not reflect these fixed costs, which are continually being built in, in machines and brick and mortar. For a given level of annual expenditure, as the installations increase the amount of research will decrease. Mr. Zuckert hoped that an accounting system would be devised which would segregate the costs of the fixed establishment from those of the direct effort. He also hoped that it would be possible to alleviate the BNL difficulties which arise from the fact that the Laboratory gets funds from three separate sources in the AEC and has no separate fund for its overall operation. Such an accounting plan was being worked on, and might be ready for the FY56 budget.

Dr. Rabi said the GAC has been greatly perturbed by the language of the House report, which betrayed a lack of understanding of the nature of basic research. Mr. Nichols agreed, and said a campaign on Congressmen by scientists was probably needed.

Boiling Water Reactor

With regard to the General Manager's request for an evaluation of the BWR, Dr. Rabi said the Committee had had no document which could serve as a basis for a technical evaluation, but that the Reactor

Subcommittee would visit ANL or Arco during the first half of July (to be arranged with Dr. Zinn). Dr. Smyth and Mr. Nichols expressed the hope that the Subcommittee would also consider whether the BWR were receiving a disproportionate share of enthusiasm, at the expense of the fast breeder work. (Appendix C, item 4)

There was some discussion of the homogeneous reactor. Mr. Whitman mentioned his feeling of encouragement after visiting Oak Ridge. Dr. Smyth and Mr. Nichols raised the question whether one of the intermediate steps before the full-scale reactor should not be skipped. Dr. Wigner said that although the Laboratory was concerned by some of the technical problems, it would probably agree to omit the next intermediate step if encouraged to do so. Mr. Whitman had an impression that it was in part a political question and that Oak Ridge would probably omit the next step if the full-scale reactor were approved.

Homogeneous Reactor

Commenting on U-233, Dr. Rabi said that the Committee felt that going ahead with it was a good idea, worthwhile in its own right. However, not enough information had been available at this meeting to serve as a basis for any far-reaching conclusions. He hoped that the Operations Analysis paper which considered U-233 in relation to other questions could be available at the next meeting. (Appendix C, item 2)

U-233

Dr. Rabi next commented that the GAC favored the encouragement of isotope separation research wherever possible. Mr. Whitman suggested that K-25 could be encouraged to do more along this line. (Appendix C, item 3c)

Plutonium Isotope Separation

The next subject discussed was the appearance of a column in the New York Times in which W. L. Laurence had made some statements which

New York Times

appeared seriously to violate security. (Specifically, it had been stated that tritium was no longer required for our thermonuclear weapons.) The GAC deplored this both as a terrible leak of security information and as very damaging to morale in the Commission's laboratories, and wished to bring the matter to the Commission's attention. There was considerable discussion on this subject.

Dates of Next Meeting

Dr. Rabi informed the visitors that the next meeting of the GAC would be on May 27, 28, and 29, and that it would hold a party for the Commissioners and their principal staff on the 28th.

At 11:40 a.m. the visitors left.

Before adjournment, Dr. von Neumann asked if the Weapon Subcommittee could visit Los Alamos, Sandia, and Livermore about the middle of July. This was agreed on, and Dr. von Neumann said he would arrange it in tandem with the trip of the Reactor Subcommittee. (Appendix C, item 4)

At 11:45 a.m. this final session was adjourned.

Richard W. Dodson
Secretary

Attachments:
Appendix A -- Schedule
Appendices B and C --
Chairman's Report

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GENERAL ADVISORY COMMITTEE
to the
U. S. ATOMIC ENERGY COMMISSION
Washington 25, D. C.

March 30, 1954

The following is the tentative Schedule* for the 39th Meeting of the General Advisory Committee, to be held in room 213 on March 31, April 1 and 2:

March 31 (Wednesday):

9:30 a.m. -- Executive Session
11:00 a.m. -- Meeting with the Commissioners and General Manager

1:30 p.m. -- Intelligence Matters.....Dr. Reichardt
2:00 p.m. -- Research Matters.....Dr. T. H. Johnson
3:30 p.m. -- Weapon Matters.....Col. Huston, Dr. Claus, Dr. Dunham
4:30 p.m. -- Executive Session

April 1 (Thursday):

9:30 a.m. -- Weapon Matters.....Col. Dorsey, Dr. Mark, Dr. Froman
11:30 a.m. -- Production and Raw Materials.....Dr. Pittman, Mr. J. C. Johnson

1:30 p.m. -- Executive Session

April 2 (Friday):

9:30 a.m. -- Executive Session
10:30 a.m. -- Meeting with the Commissioners and General Manager
12:00 noon -- Adjournment

Richard W. Dodson
Secretary

*Changes in Schedule may be found necessary in advance of or during the Meeting. The offices of the Commissioners, the General Manager, and the Secretary will be kept informed of any changes.

DISTRIBUTION: Commissioners (5)
General Manager (2)
Secretary, AEC (16)
Secretary, GAC (14)

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GENERAL ADVISORY COMMITTEE
to the
U. S. ATOMIC ENERGY COMMISSION
Washington 25, D. C.

April 9, 1954

Mr. Lewis L. Strauss, Chairman
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Strauss:

This letter is the first section of the usual report of the Chairman of the General Advisory Committee to the Chairman of the Atomic Energy Commission which follows a meeting of the GAC. This letter covers the discussion of the GAC at its meetings on March 31, April 1 and 2, 1954, of the staff papers and recommendations with respect to the Nevada Proving Grounds (AEC 141/22 and 141/23; Report of the Committee to Study the NPG, dated Feb. 1, 1954; Report of the Advisory Committee for Biology and Medicine).

The General Advisory Committee has already made its views on the subject of weapon testing known to the AEC in the report of the Chairman of the GAC dated February 10, 1953. The relevant paragraph reads as follows:

"The level of effort in test programs has been increased greatly in recent years; this has undoubtedly been a very significant factor in the weapon progress which has been achieved. We feel that the test programs are technically very desirable and are extremely useful in the Commission's program of weapon development. There are indications that, even in its present advanced status, our actual test capability may not be adequate for all of the experiments which it would be valuable to carry out; and, hence, we have considered whether this capability should be increased. Since the results of the test programs are certain to affect the optimum composition of the stockpile with respect to weapon types, and since the information will be most useful before the stockpile increases to the point that weapon refabrication becomes an unmanageable task, we are led to favor an increase in the weapon testing capabilities in the near future."

[redacted]

[redacted]

The GAC wishes to reaffirm the views previously expressed with respect to the importance of tests of nuclear weapon design as a necessary means of progress. The GAC further strongly endorses the recommendations in the staff papers with respect to the NPG.

However, the GAC does not believe that the number of tests should be limited to 10 per year as suggested, but that the number should be determined by the needs of the weapon laboratories and the Division of Military Application.

The GAC fully endorses the recommendation that each proposal for a test should be scrutinized with the utmost care as to need, and that no effort should be spared to exercise the greatest precautions to safeguard the surrounding communities and the test personnel with respect to fall-out, blast, and blast damage. With the increased understanding of these proposals, precautionary measures become more effective.

The GAC knows of no substitute for tests on the continental site to maintain our lead in the field of atomic weapons. We have seen no suggestion for another site which has the advantages of the NPG.

The GAC therefore recommends that the use of the NPG be continued, and that no arbitrary limitation should be imposed on the number of tests in any given period. At the same time the GAC recognizes that unless the greatest precautions are taken, a certain element of danger will always attend tests of nuclear weapons.

Sincerely yours,

I. I. Rabi
Chairman

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GENERAL ADVISORY COMMITTEE
to the
U. S. ATOMIC ENERGY COMMISSION
Washington 25, D. C.

April 10, 1954

Mr. Lewis L. Strauss, Chairman
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Strauss:

Herewith is the summary report of the 39th Meeting of the General Advisory Committee, held in Washington on March 31, April 1 and 2, 1954.

All members were in attendance.

We wish to thank the Commission and its staff for their cooperation in supplying background information for the subjects which we considered, and in arranging for the attendance of staff and of Drs. Froman and Mark of the Los Alamos Laboratory, who greatly aided the deliberations of our Committee at this meeting. [redacted] DOE 6.1(b) (2) the problems of production of fissionable materials and of tritium and lithium-6 -- included in these deliberations were discussions of the problems raised by pre-initiation in thermonuclear weapons; (3) the problems of the Research Division in a number of specific aspects which will be detailed below; (4) ways and means of answering the question which the General Manager directed to us on the subject of the boiling water reactor.

We also discussed at length the use of the Nevada Proving Grounds for further tests. Our conclusions in this matter are being forwarded to you in a separate letter.

[redacted] DOE 2.1(a) These tremendously successful tests go far to alleviate some of the concern expressed in the last report of the Committee with regard to the thoroughgoing change which seemed to be necessary in the materials requirements as a result of the DOD request. We now feel as a result of our meeting that our objectives can be met without any serious disruptions of the main parts of the program. We hope that the Commission will find some appropriate way to express the debt which we all owe to the Los Alamos Laboratory for their brilliant achievements in the defense of our country.

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(2) From our discussions with Dr. Froman and Dr. Mark, we suspect that the problems which have been raised with regard to the possible incidence and effects of pre-initiation are now less pressing as a result of the Castle tests. It seems likely to us that the pressure for the production of plutonium of a better grade than 200 g/T is greatly diminished. In this connection, we reiterate our suggestion that at the next test series at the NPG, a test be made to determine more accurately the conditions for pre-initiation. In the same connection, the GAC felt it desirable that we proceed with the production of U-233, at least in the amounts contemplated at the time of our meeting, because it seems likely that the problem of pre-initiation may arise again in connection with other weapon developments. In any event the properties of U-233 as a weapon material are well worth exploring.

(3) Research

a) We were very much concerned at the reduction in the budget for research which was made in the House Appropriations Committee and fervently hope that the budget will be restored to the requested amount of $42 million. The increase in the research facilities of various laboratories, both on-site and off-site, and the general improvement of the level of research both in quality and quantity make this cut appear very unwise at the present time. The necessary overhead expenses, which must increase as the facilities themselves increase, are such that a budget cut would mean the elimination of researches in the on-site laboratories which are of great importance to the whole research program. It will surely be agreed that the great increase in the Commission's program, both in magnitude and variety, should be reflected by an appropriate increase in the research effort.

b) We have previously had occasion to remark on the excellence of the joint ONR-AEC program in nuclear physics. We recommend that the Commission try to find ways and means to continue this program, at least at the old level, without the expenditure of longevity funds which are so important for the stability of a research program in the university environment.

c) It has always been difficult to obtain sufficient effort directed towards research leading to methods of isotope separation. The GAC feels that the Commission should be very responsive to proposals from Commission laboratories or other research organizations for research in this field.

d) The GAC had the opportunity of discussing with the General Manager the Commission policy with respect to the employment and admittance of aliens to unclassified research in Commission laboratories. We feel that the policy adopted by the Commission is a very good one. However, it has come to our attention that in practice the implementation of this policy suffers from very long delays in AEC action on requests for

approval. These delays are frustrating to laboratory personnel and administration and very often result in the unnecessary loss of efficiency and good will. We hope that the Commission policy will be promulgated to the laboratories concerned and that decisions with regard to approval can be made more promptly in the future.

(4) During the month of July, the Subcommittee on Reactors, Materials and Production intends to make a series of visits to various sites, including the Argonne National Laboratory, in order to be able to comment on questions raised by the General Manager with regard to reactor development and to the boiling water reactor in particular. Later in the same month, the Weapons Subcommittee intends to visit Los Alamos, Sandia and possibly Livermore to discuss recent developments and plans for the future.

The next meeting of the GAC will be held in Washington on May 27, 28, and 29, 1954. In the meantime, the members of the Committee will continue to be available to the Commission for any problems which may arise.

Sincerely yours,

I. I. Rabi
Chairman