IV

~~TOP SECRET~~

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NOTES OF THE INTERIM COMMITTEE MEETING
THURSDAY, 31 MAY 1945
10:00 A.M. to 1:15 P.M.- 2:15 P.M. to 4:15 P.M.

PRESENT:

Members of the Committee

Secretary Henry L. Stimson, Chairman
Hon. Ralph A. Bard
Dr. Vannevar Bush
Hon. James F. Byrnes
Hon. William L. Clayton
Dr. Karl T. Compton
Dr. James B. Conant
Mr. George L. Harrison

Invited Scientists

Dr. J. Robert Oppenheimer
Dr. Enrico Fermi
Dr. Arthur H. Compton
Dr. E. O. Lawrence

By Invitation

General George C. Marshall
Major Gen. Leslie R. Groves
Mr. Harvey H. Bundy
Mr. Arthur Page

To ...
By authority of: SEC. ARMY
BY TAG per 710554
Date 9/29/71 WHC-NARS

I. OPENING STATEMENT OF THE CHAIRMAN:

Secretary Stimson explained that the Interim Committee had been appointed by him, with the approval of the President, to make recommendations on temporary war-time controls, public announcement, legislation and post-war organization. The Secretary gave high praise to the brilliant and effective assistance rendered to the project by the scientists of the country and expressed great

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appreciation to the four scientists present for their great contributions to the work and their willingness to advise on the many complex problems that the Interim Committee had to face. He expressed the hope that the scientists would feel completely free to express their views on any phase of the subject.

The Committee had been termed an "Interim Committee" because it was expected that when the project became more widely known a permanent organization established by Congressional action or by treaty arrangements would be necessary.

The Secretary explained that General Marshall shared responsibility with him for making recommendations to the President on this project with particular reference to its military aspects; therefore, it was considered highly desirable that General Marshall be present at this meeting to secure at first hand the views of the scientists.

The Secretary expressed the view, a view shared by General Marshall, that this project should not be considered simply in terms of military weapons, but as a new relationship of man to the universe. This discovery might be compared to the discoveries of the Copernican theory and of the laws of gravity, but far more important than these in its effect on the lives of men. While the advances in the field to date had been fostered by the needs of war, it was important to realize that the implications of the project went far beyond the needs of the present war. It must be controlled if possible to make it an assurance of future peace rather than a menace to civilization.

The Secretary suggested that he hoped to have the following questions discussed during the course of the meeting:

1. Future military weapons.
2. Future international competition.
3. Future research.
4. Future controls.
5. Future developments, particularly non-military.

II. STAGES OF DEVELOPMENT:

As a technical background for the discussions, Dr. A. H. Compton explained the various stages of development. The first stage involved the separation of uranium 235. The second stage involved the use of "breeder" piles to produce enriched materials from which plutonium or new types of uranium could be obtained. The first stage was being used to produce material for the present bomb while the second stage would produce atomic bombs with a tremendous increase in explosive power over those now in production. Production of enriched materials was now on the order of pounds or hundreds of pounds and it was contemplated that the scale of operations could be expanded sufficiently to produce many tons. While bombs produced from the products of the second stage had not yet been proven in actual operation, such bombs were considered a scientific certainty. It was estimated that from January 1946 it would take one and one-half years to prove this second stage in view of certain technical and metallurgical difficulties, that it would take three

years to get plutonium in volume, and that it would take perhaps six years for any competitor to catch up with us.

Dr. Fermi estimated that approximately twenty pounds of enriched material would be needed to carry on research in current engineering problems and that a supply of one-half to one ton would be needed for research on the second stage.

In response to the Secretary's question, Dr. A. H. Compton stated that the second stage was dependent upon vigorous exploitation of the first stage and would in no way vitiate the expenditure already made on the present plant.

Dr. Conant mentioned a so-called "third stage" of development in which the products of the "second stage" would be used simply as a detonator for heavy water. He asked Dr. Oppenheimer for an estimate of the time factor involved in developing this phase. Dr. Oppenheimer stated that this was a far more difficult development than the previous stages and estimated that a minimum of three years would be required to reach production. He pointed out that heavy water (hydrogen) was much cheaper to produce than the other materials and could eventually be obtained in far greater quantity.

Dr. Oppenheimer reviewed the scale of explosive force involved in these several stages. One bomb produced in the first stage was estimated to have the explosive force of 2,000 - 20,000 tons of TNT. The actual blast effect would be accurately measured when the test was made. In the second stage the explosive force

was estimated to be equal to 50,000 - 100,000 tons of TNT. It was considered possible that a bomb developed from the third stage might produce an explosive force equal to 10,000,000 - 100,000,000 tons of TNT.

III. DOMESTIC PROGRAM:

Dr. Lawrence expressed his great appreciation for the fact that the leaders of the Government had been willing to take the chances inherent in the development of this program. He expressed a view that if the United States were to stay ahead in this field it was imperative that we knew more and did more than any other country. He felt that research had to go on unceasingly. There were many unexplored possibilities in terms of new methods and new materials beyond thorium and uranium. In fact, all heavy elements held potentialities for exploitation in this field. He thought it might be possible one day to secure our energy from terrestrial sources rather than from the sun. Dr. Lawrence pointed out that there was no real doubt about the soundness of the program. Any failures that had occurred or would occur in the future were nothing more than temporary setbacks and there was every reason to believe that such setbacks would be quickly overcome.

Dr. Lawrence recommended that a program of plant expansion be vigorously pursued and at the same time a sizable stock pile of bombs and material should be built up. For security reasons

plants that were built should be widely scattered throughout the country. Every effort should be made to encourage industrial application and development. Only by vigorously pursuing the necessary plant expansion and fundamental research, and by securing adequate government support could this nation stay out in front. With this view Dr. A. H. Compton expressed complete agreement.

Dr. Karl T. Compton, summarizing the views expressed above, suggested the following program:

1. Expand production under the first stage to produce bombs for stock pile and to furnish material for research.
2. Intensify "second stage" research.
3. Build necessary "second stage" pilot plants.
4. Produce the new product.

Dr. Oppenheimer pointed out that one of the difficult problems involved in guiding a future domestic program would be the allocation of materials as between different uses. Dr. Karl T. Compton added further that every effort should be made to encourage industrial progress in order that our fundamental research program would be strengthened.

The Secretary summarized the views of the group concerning our domestic program as follows:

1. Keep our industrial plant intact.
2. Build up sizable stock piles of material for military use and for industrial and technical use.
3. Open the door to industrial development.

IV. FUNDAMENTAL RESEARCH:

Dr. Oppenheimer felt that the work now being done under war pressure was simply a process of plucking the fruits of earlier research. In order to exploit more fully the potentialities of this field, it was felt that a more leisurely and a more normal research situation should be established. Dr. Oppenheimer strongly urged that numbers of the present staff should be released to go back to their universities and research laboratories in order to explore the many ramifications of this field, to avoid the sterility of the present orientation to specific problems only, and to develop cheaper and simpler methods of production. Dr. Bush expressed the view that while it ~~is~~ was imperative in war time to concentrate on specific problems such a narrowing of the field in peace time was completely wrong. He agreed with Dr. Oppenheimer that only a nucleus of the present staff should be retained and that as many as possible should be released for broader and freer inquiry. Drs. A. H. Compton and Fermi reenforced this view by emphasizing that we could never be sure of the tremendous possibilities in this field until thorough fundamental research could be brought to bear.

V. PROBLEMS OF CONTROL AND INSPECTION:

The Secretary inquired what other potentialities beyond purely military uses might be exploited. In reply Dr. Oppenheimer pointed out that the immediate concern had been to shorten the war. The research that had lead to this development had only opened the

door to future discoveries. Fundamental knowledge of this subject was so wide spread throughout the world that early steps should be taken to make our developments known to the world. He thought it might be wise for the United States to offer to the world free interchange of information with particular emphasis on the development of peace-time uses. The basic goal of all endeavors in the field should be the enlargement of human welfare. If we were to offer to exchange information before the bomb was actually used, our moral position would be greatly strengthened.

The Secretary stated that an understanding of the non-military potentialities was a necessary background to the consideration of the question of interchange of information and international co-operation. He referred to the Bush-Conant memorandum which had stressed the role of science in securing a policy of self-restraint. This memorandum had recommended that in any international organization which might be established complete scientific freedom should be provided for and the right of inspection should be given to an international control body. The Secretary asked what kind of inspection might be effective and what would be the position of democratic governments as against totalitarian regimes under such a program of international control coupled with scientific freedom. The Secretary said that it was his own feeling that the democratic countries had fared pretty well in this war. Dr. Bush indorsed this view vigorously, pointing out that our advantage over totalitarian states had been tremendous. Evidence just in from Germany

revealed that she was far behind us in the technology of this field and in other scientific fields. He said that our tremendous advantage stemmed in large measure from our system of team work and free interchange of information by which we had won out and would continue to win out in any competitive scientific and technological race. He expressed some doubt, however, of our ability to remain ahead permanently if we were to turn over completely to the Russians the results of our research under free competition with no reciprocal exchange. Dr. Karl T. Compton felt that we would hold our advantage at least to the extent of the construction lag, but, in any event, he felt that secrets of this nature could not be successfully kept for any period of time and that we could safely share our knowledge and still remain ahead.

Dr. A. H. Compton stated that the destructive applications of these discoveries were perhaps easier to control than the constructive ones. He referred to the nuclonics prospectus prepared some time ago in which were indicated certain other potential uses in such fields as naval propulsion, health, chemistry, and industrial development. He pointed out that Faraday's hopes and predictions in the field of electro-dynamics were realized by Edison only after the lapse of several decades. Such a lag in this field with as yet uncharted possibilities seemed likely. He stressed the impossibility of keeping technological advances secret, as witness the experience of industry. The fundamental knowledge in this field was known

in many countries and a policy of restraint, of the nationalization of scientific ideas could not work. Unless scientists were able to keep abreast of advances in the field throughout the world they would probably lose out on many developments.

Dr. Conant felt that international control in this field would require the power of inspection and that international arrangements among scientists would be by a means of strengthening this power. Dr. Oppenheimer expressed doubts concerning the possibility of knowing what was going on in this field in Russia, but expressed the hope that the fraternity of interest among scientists would aid in the solution.

General Marshall cautioned against putting too much faith in the effectiveness of the inspection proposal. Mr. Clayton also expressed considerable doubt on this point.

VI. RUSSIA:

In considering the problem of controls and international collaboration the question of paramount concern was the attitude of Russia. Dr. Oppenheimer pointed out that Russia had always been very friendly to science and suggested that we might open up this subject with them in a tentative fashion and in the most general terms without giving them any details of our productive effort. He thought we might say that a great national effort had been put into this project and express a hope for cooperation with them in this field. He felt strongly that we should not prejudge the

Russian attitude in this matter.

At this point General Marshall discussed at some length the story of charges and counter-charges that have been typical of our relations with the Russians, pointing out that most of these allegations have proven unfounded. The seemingly uncooperative attitude of Russia in military matters stemmed from the necessity of maintaining security. He said that he had accepted this reason for their attitude in his dealings with the Russians and had acted accordingly. As to the post-war situation and in matters other than purely military, he felt that he was in no position to express a view. With regard to this field he was inclined to favor the building up of a combination among like-minded powers, thereby forcing Russia to fall in line by the very force of this coalition. General Marshall was certain that we need have no fear that the Russians, if they had knowledge of our project, would disclose this information to the Japanese. He raised the question whether it might be desirable to invite two prominent Russian scientists to witness the test.

Mr. Byrnes expressed a fear that if information ~~was~~ WERE given to the Russians, even in general terms, Stalin would ask to be brought into the partnership. He felt this to be particularly likely in view of our commitments and pledges of cooperation with the British. In this connection Dr. Bush pointed out that even the British do not have any of our blue prints on plants. Mr. Byrnes

expressed the view, which was generally agreed to by all present, that the most desirable program would be to push ahead as fast as possible in production and research to make certain that we stay ahead and at the same time make every effort to better our political relations with Russia.

VII. INTERNATIONAL PROGRAM:

Dr. A. H. Compton stressed very strongly the need for maintaining ourselves in a position of superiority while at the same time working toward adequate political agreements. He favored freedom of competition and freedom of research activity to as great an extent as possible consistent with security and the international situation. To maintain rigid security over this project would result in a certain sterility of research and a very real competitive disadvantage to the nation. He felt that within the larger field of freedom for research it would still be possible to maintain close security of the military aspects of the field. We could maintain our technical advantage over other nations only by drawing on the free interchange of scientific investigation and curiosity. He urged the view, expressed earlier by General Marshall, that we should secure agreements for cooperation with other like-minded nations and at the same time work toward solidifying our relations with the Russians.

Dr. A. H. Compton recommended that roughly the following program should be adopted for at least a decade:

1. Freedom of research be developed to the utmost consistent with national security and military necessity.

2. A combination of democratic powers be established for cooperation in this field.

3. A cooperative understanding be reached with Russia.

The meeting adjourned for luncheon at 1:15 P.M. and resumed at 2:15 P.M. All who attended the morning session were present with the exception of General Marshall.

VIII. EFFECT OF THE BOMBING ON THE JAPANESE AND THEIR WILL TO FIGHT:

It was pointed out that one atomic bomb on an arsenal would not be much different from the effect caused by any Air Corps strike of present dimensions. However, Dr. Oppenheimer stated that the visual effect of an atomic bombing would be tremendous. It would be accompanied by a brilliant luminescence which would rise to a height of 10,000 to 20,000 feet. The neutron effect of the explosion would be dangerous to life for a radius of at least two-thirds of a mile.

After much discussion concerning various types of targets and the effects to be produced, the Secretary expressed the conclusion, on which there was general agreement, that we could

not give the Japanese any warning; that we could not concentrate on a civilian area; but that we should seek to make a profound psychological impression on as many of the inhabitants as possible. At the suggestion of Dr. Conant the Secretary agreed that the most desirable target would be a vital war plant employing a large number of workers and closely surrounded by workers' houses.

There was some discussion of the desirability of attempting several strikes at the same time. Dr. Oppenheimer's judgment was that several strikes would be feasible. General Groves, however, expressed doubt about this proposal and pointed out the following objections: (1) We would lose the advantage of gaining additional knowledge concerning the weapon at each successive bombing; (2) such a program would require a rush job on the part of those assembling the bombs and might, therefore, be ineffective; (3) the effect would not be sufficiently distinct from our regular Air Force bombing program.

IX. HANDLING OF UNDESIRABLE SCIENTISTS:

General Groves stated that the program has been plagued since its inception by the presence of certain scientists of doubtful discretion and uncertain loyalty. It was agreed that nothing could be done about dismissing these men until after the bomb has actually been used or, at best, until after the test has been made. After some publicity concerning the weapon was out, steps should be taken to sever these scientists from the program

and to proceed with a general weeding out of personnel no longer needed.

X. CHICAGO GROUP:

Dr. A. H. Compton outlined briefly the nature and size of the Chicago program. In line with directives from General Groves it was intended to limit the operations at Chicago to those useful in the prosecution of this war. Its activities fell into the following categories:

1. Aid to the Hanford project on plutonium development.
2. Aid to the Santa Fe group.
3. Research on a thorium using pile.
4. Preliminary investigations of the extension of uranium piles.
5. Studies of the health of personnel working with these materials.

It was pointed out that programs 3 and 4 above did not bear directly on current war use, but that they comprised only about 20 per cent of the work being carried on in Chicago and that it was considered desirable in terms of future development to continue this work.

It was the consensus of the meeting that the Committee should lean on the recommendations of Drs. Conant and Bush as to what should be done with the Chicago group. Dr. Bush, as seconded by Dr. Conant, recommended that the present programs, including

Chicago, should be continued at their present levels until the end of the war. It was agreed that this recommendation should be transmitted to the Secretary of War.

XI. POSITION OF THE SCIENTIFIC PANEL:

Mr. Harrison stated that the Scientific Panel had been called in at the suggestion of Drs. Bush and Conant and with the heartiest approval of all members of the Committee. It was considered a continuing Panel which was free to present its views to the Committee at any time. The Committee was particularly anxious to secure from the scientists their ideas of just what sort of organization should be established to direct and control this field. The Committee requested the Panel to prepare as speedily as possible a draft of their views on this subject. In this connection Dr. Bush pointed out that there would be no need at this time in drawing up a draft of an organization in this field to consider relationships with the Research Board for National Security. Dr. Karl T. Compton suggested that the organization could be tied in later to the Research Board for National Security through its section on nuclear physics.

The question was raised as to what the scientists might tell their people about the Interim Committee and their having been called before it. It was agreed that the four scientists should feel free to tell their people that an Interim Committee appointed by the Secretary of War and with the Secretary of War as Chairman

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had been established to deal specifically with the problems of control, organization, legislation, and publicity. The identity of the members of the Committee should not be divulged. The scientists should be permitted to explain that they had met with this Committee and had been given complete freedom to present their views on any phase of the subject. The impression should definitely be left with their people that the Government was taking a most active interest in this project.

XII. NEXT MEETING:

The next meeting of the Committee was scheduled for Friday, 1 June 1945, at 11:00 A.M. in the office of the Secretary of War. The purpose of this meeting was to secure the views of four representatives from industry.

The meeting adjourned at 4:15 P.M.

R. Gordon Arneson

R. GORDON ARNESON
2nd Lieutenant, A.U.S.
Secretary